

Solução do Problema SHIP04S - Solver HiGHS

Análise Computacional

16 de setembro de 2025

1 Informações do Problema

Informações do Problema:

- Nome: SHIP04S
- Número de Variáveis: 1458
- Número de Restrições: 402
- Inviabilidade Primal: 0.000e+00
- Inviabilidade Dual: 0.000e+00
- Valor Primal: 1.799e+06
- Valor Dual: 1.799e+06
- Gap: 7.196e-23
- Número de Iterações: 18

2 Variáveis Primais e Custos Reduzidos

Tabela 1: Variáveis primais e custos reduzidos do problema SHIP04S

| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|------------|--------------|-------------|
| 1 | 190.917628 | 1 | 0.000000 |
| 2 | 25.103974 | 2 | 0.000000 |
| 3 | 31.244391 | 3 | 0.000000 |
| 4 | 14.696029 | 4 | 0.000000 |
| 5 | 49.737791 | 5 | 0.000000 |
| 6 | 27.700015 | 6 | 0.000000 |
| 7 | 44.000024 | 7 | 0.000000 |
| 8 | 0.000000 | 8 | 1405.052408 |
| 9 | 0.000000 | 9 | 1405.052408 |
| 10 | 0.000000 | 10 | 2463.474408 |
| 11 | 0.000000 | 11 | 2463.474408 |
| 12 | 0.000000 | 12 | 1043.628408 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 13 | 0.000000 | 13 | 764.548735 |
| 14 | 0.000000 | 14 | 1043.628408 |
| 15 | 0.000000 | 15 | 667.700000 |
| 16 | 0.000000 | 16 | 672.134000 |
| 17 | 0.000000 | 17 | 400.432000 |
| 18 | 0.000000 | 18 | 853.582000 |
| 19 | 0.000000 | 19 | 523.788000 |
| 20 | 0.000000 | 20 | 509.076000 |
| 21 | 0.000000 | 21 | 509.546000 |
| 22 | 0.000000 | 22 | 856.034000 |
| 23 | 0.000000 | 23 | 708.158000 |
| 24 | 0.000000 | 24 | 1283.908000 |
| 25 | 0.000000 | 25 | 645.162000 |
| 26 | 0.000000 | 26 | 784.926000 |
| 27 | -0.000000 | 27 | 0.000000 |
| 28 | 0.000000 | 28 | 468.332000 |
| 29 | 0.000000 | 29 | 178.996000 |
| 30 | 0.000000 | 30 | 494.834000 |
| 31 | 0.000000 | 31 | 63.282000 |
| 32 | 0.000000 | 32 | 230.018000 |
| 33 | 0.000000 | 33 | 183.900000 |
| 34 | 0.000000 | 34 | 774.832000 |
| 35 | 0.000000 | 35 | 684.864000 |
| 36 | 0.000000 | 36 | 808.690000 |
| 37 | 0.000000 | 37 | 524.258000 |
| 38 | 0.000000 | 38 | 259.442000 |
| 39 | -0.000000 | 39 | 0.000000 |
| 40 | 0.000000 | 40 | 489.174000 |
| 41 | 0.000000 | 41 | 433.534000 |
| 42 | 0.000000 | 42 | 47.814000 |
| 43 | 0.000000 | 43 | 321.968000 |
| 44 | 0.000000 | 44 | 438.438000 |
| 45 | 0.000000 | 45 | 218.984000 |
| 46 | 4.865580 | 46 | 0.000000 |
| 47 | 0.000000 | 47 | 454.846000 |
| 48 | 0.000000 | 48 | 433.534000 |
| 49 | 0.000000 | 49 | 53.944000 |
| 50 | 0.000000 | 50 | 511.998000 |
| 51 | 0.000000 | 51 | 261.894000 |
| 52 | 0.000000 | 52 | 361.200000 |
| 53 | 0.000000 | 53 | 158.910000 |
| 54 | 17.458800 | 54 | 0.000000 |
| 55 | 0.000000 | 55 | 519.824000 |
| 56 | 0.000000 | 56 | 542.648000 |
| 57 | 0.000000 | 57 | 257.460000 |
| 58 | 0.000000 | 58 | 702.028000 |
| 59 | 0.000000 | 59 | 380.816000 |
| 60 | 0.000000 | 60 | 618.660000 |
| 61 | 0.000000 | 61 | 382.042000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|------------|
| 62 | 7.155260 | 62 | 0.000000 |
| 63 | 0.000000 | 63 | 567.638000 |
| 64 | 0.000000 | 64 | 508.320000 |
| 65 | 0.000000 | 65 | 251.330000 |
| 66 | 0.000000 | 66 | 589.236000 |
| 67 | 0.000000 | 67 | 375.912000 |
| 68 | 0.000000 | 68 | 366.104000 |
| 69 | 8.300100 | 69 | 0.000000 |
| 70 | 0.000000 | 70 | 487.948000 |
| 71 | 0.000000 | 71 | 453.150000 |
| 72 | 0.000000 | 72 | 170.414000 |
| 73 | 0.000000 | 73 | 570.846000 |
| 74 | 0.000000 | 74 | 431.082000 |
| 75 | 0.000000 | 75 | 286.414000 |
| 76 | 4.293160 | 76 | 0.000000 |
| 77 | 0.000000 | 77 | 78.464000 |
| 78 | 0.000000 | 78 | 407.788000 |
| 79 | 0.000000 | 79 | 166.736000 |
| 80 | 0.000000 | 80 | 616.208000 |
| 81 | 0.000000 | 81 | 226.340000 |
| 82 | 0.000000 | 82 | 288.866000 |
| 83 | 5.438000 | 83 | 0.000000 |
| 84 | 0.000000 | 84 | 664.492000 |
| 85 | 0.000000 | 85 | 590.462000 |
| 86 | 0.000000 | 86 | 69.882000 |
| 87 | 0.000000 | 87 | 735.130000 |
| 88 | 0.000000 | 88 | 363.652000 |
| 89 | 0.000000 | 89 | 212.854000 |
| 90 | 11.448400 | 90 | 0.000000 |
| 91 | 0.000000 | 91 | 495.304000 |
| 92 | 0.000000 | 92 | 487.478000 |
| 93 | 0.000000 | 93 | 166.736000 |
| 94 | 0.000000 | 94 | 666.474000 |
| 95 | 0.000000 | 95 | 323.194000 |
| 96 | 0.000000 | 96 | 288.866000 |
| 97 | 7.155260 | 97 | 0.000000 |
| 98 | 0.000000 | 98 | 518.598000 |
| 99 | 0.000000 | 99 | 482.574000 |
| 100 | 0.000000 | 100 | 99.306000 |
| 101 | 0.000000 | 101 | 704.480000 |
| 102 | 0.000000 | 102 | 309.708000 |
| 103 | 0.000000 | 103 | 198.142000 |
| 104 | 12.020800 | 104 | 0.000000 |
| 105 | 0.000000 | 105 | 11.034000 |
| 106 | 0.000000 | 106 | 331.776000 |
| 107 | 0.000000 | 107 | 241.522000 |
| 108 | 0.000000 | 108 | 563.490000 |
| 109 | 0.000000 | 109 | 112.322000 |
| 110 | 0.000000 | 110 | 303.578000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|------------|
| 111 | 6.869050 | 111 | 0.000000 |
| 112 | 0.000000 | 112 | 337.150000 |
| 113 | 0.000000 | 113 | 500.964000 |
| 114 | 0.000000 | 114 | 187.578000 |
| 115 | 0.000000 | 115 | 644.406000 |
| 116 | 0.000000 | 116 | 220.210000 |
| 117 | 0.000000 | 117 | 275.380000 |
| 118 | 2.003470 | 118 | 0.000000 |
| 119 | 0.000000 | 119 | 65.734000 |
| 120 | 5.151790 | 120 | 0.000000 |
| 121 | 0.000000 | 121 | 415.614000 |
| 122 | 0.000000 | 122 | 532.840000 |
| 123 | 0.000000 | 123 | 3.678000 |
| 124 | 0.000000 | 124 | 731.452000 |
| 125 | 0.000000 | 125 | 470.314000 |
| 126 | 0.000000 | 126 | 129.486000 |
| 127 | 0.000000 | 127 | 79.690000 |
| 128 | 0.000000 | 128 | 805.482000 |
| 129 | 0.000000 | 129 | 580.654000 |
| 130 | 11.448400 | 130 | 0.000000 |
| 131 | 0.000000 | 131 | 477.670000 |
| 132 | 0.000000 | 132 | 451.924000 |
| 133 | 0.000000 | 133 | 114.774000 |
| 134 | 2.003470 | 134 | 0.000000 |
| 135 | 0.000000 | 135 | 72.334000 |
| 136 | 0.000000 | 136 | 217.002000 |
| 137 | 0.000000 | 137 | 541.422000 |
| 138 | 6.010420 | 138 | 0.000000 |
| 139 | 0.000000 | 139 | 699.576000 |
| 140 | 0.000000 | 140 | 188.334000 |
| 141 | 0.000000 | 141 | 0.000000 |
| 142 | 0.000000 | 142 | 592.158000 |
| 143 | 0.000000 | 143 | 478.896000 |
| 144 | 6.296630 | 144 | 0.000000 |
| 145 | 0.000000 | 145 | 362.426000 |
| 146 | 0.000000 | 146 | 329.324000 |
| 147 | 0.000000 | 147 | 84.124000 |
| 148 | 0.000000 | 148 | 52.718000 |
| 149 | 0.000000 | 149 | 616.678000 |
| 150 | 0.000000 | 150 | 534.066000 |
| 151 | 8.300100 | 151 | 0.000000 |
| 152 | 0.000000 | 152 | 416.370000 |
| 153 | 0.000000 | 153 | 154.006000 |
| 154 | 1.717260 | 154 | 0.000000 |
| 155 | 1.144840 | 155 | 0.000000 |
| 156 | 3.148320 | 156 | 0.000000 |
| 157 | 0.000000 | 157 | 248.878000 |
| 158 | 0.000000 | 158 | 483.800000 |
| 159 | 0.000000 | 159 | 153.250000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|------------|
| 160 | 0.000000 | 160 | 623.564000 |
| 161 | 0.000000 | 161 | 294.996000 |
| 162 | 0.000000 | 162 | 239.826000 |
| 163 | 1.717260 | 163 | 0.000000 |
| 164 | 0.000000 | 164 | 274.154000 |
| 165 | 0.015345 | 165 | 0.000000 |
| 166 | 0.000000 | 166 | 483.044000 |
| 167 | 0.000000 | 167 | 438.438000 |
| 168 | 6.853705 | 168 | 0.000000 |
| 169 | 0.000000 | 169 | 700.802000 |
| 170 | 0.000000 | 170 | 299.900000 |
| 171 | 0.000000 | 171 | 120.904000 |
| 172 | 0.000000 | 172 | 169.188000 |
| 173 | 0.000000 | 173 | 319.986000 |
| 174 | 0.000000 | 174 | 655.440000 |
| 175 | 1.431050 | 175 | 0.000000 |
| 176 | 0.000000 | 176 | 591.688000 |
| 177 | 0.000000 | 177 | 283.962000 |
| 178 | 2.862110 | 178 | 0.000000 |
| 179 | 1.431050 | 179 | 0.000000 |
| 180 | 2.862110 | 180 | 0.000000 |
| 181 | 2.003470 | 181 | 0.000000 |
| 182 | 0.858631 | 182 | 0.000000 |
| 183 | 1.717260 | 183 | 0.000000 |
| 184 | 4.579370 | 184 | 0.000000 |
| 185 | 0.000000 | 185 | 494.078000 |
| 186 | 0.000000 | 186 | 497.286000 |
| 187 | 0.000000 | 187 | 289.336000 |
| 188 | 0.000000 | 188 | 557.360000 |
| 189 | 0.000000 | 189 | 378.364000 |
| 190 | 0.000000 | 190 | 413.918000 |
| 191 | 5.724210 | 191 | 0.000000 |
| 192 | 0.000000 | 192 | 319.986000 |
| 193 | 0.000000 | 193 | 366.104000 |
| 194 | 0.000000 | 194 | 240.296000 |
| 195 | 0.000000 | 195 | 621.112000 |
| 196 | 0.000000 | 196 | 134.390000 |
| 197 | 0.000000 | 197 | 458.054000 |
| 198 | 0.000000 | 198 | 341.584000 |
| 199 | 7.727680 | 199 | 0.000000 |
| 200 | 0.000000 | 200 | 443.812000 |
| 201 | 0.000000 | 201 | 453.150000 |
| 202 | 0.000000 | 202 | 175.318000 |
| 203 | 0.000000 | 203 | 813.594000 |
| 204 | 0.000000 | 204 | 344.036000 |
| 205 | 0.000000 | 205 | 264.346000 |
| 206 | 1.144840 | 206 | 0.000000 |
| 207 | 0.000000 | 207 | 211.628000 |
| 208 | 4.293160 | 208 | 0.000000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|------------|
| 209 | 0.000000 | 209 | 315.082000 |
| 210 | 0.000000 | 210 | 359.974000 |
| 211 | 0.000000 | 211 | 186.352000 |
| 212 | 0.000000 | 212 | 657.892000 |
| 213 | 0.000000 | 213 | 135.616000 |
| 214 | 0.000000 | 214 | 344.036000 |
| 215 | 9.731160 | 215 | 0.000000 |
| 216 | 0.000000 | 216 | 584.802000 |
| 217 | 0.000000 | 217 | 502.190000 |
| 218 | 0.000000 | 218 | 158.154000 |
| 219 | 0.000000 | 219 | 779.266000 |
| 220 | 0.000000 | 220 | 340.358000 |
| 221 | 0.000000 | 221 | 293.770000 |
| 222 | 5.151790 | 222 | 0.000000 |
| 223 | 0.000000 | 223 | 476.914000 |
| 224 | 0.000000 | 224 | 252.086000 |
| 225 | 0.000000 | 225 | 197.386000 |
| 226 | 0.000000 | 226 | 568.394000 |
| 227 | 0.000000 | 227 | 180.978000 |
| 228 | 0.000000 | 228 | 460.506000 |
| 229 | 0.000000 | 229 | 355.070000 |
| 230 | 2.575890 | 230 | 0.000000 |
| 231 | 3.434530 | 231 | 0.000000 |
| 232 | 0.000000 | 232 | 511.242000 |
| 233 | 0.000000 | 233 | 402.884000 |
| 234 | 0.000000 | 234 | 176.544000 |
| 235 | 0.000000 | 235 | 523.032000 |
| 236 | 0.000000 | 236 | 276.606000 |
| 237 | 0.000000 | 237 | 390.624000 |
| 238 | 0.000000 | 238 | 380.816000 |
| 239 | 3.434530 | 239 | 0.000000 |
| 240 | 0.000000 | 240 | 221.906000 |
| 241 | 0.000000 | 241 | 386.946000 |
| 242 | 0.000000 | 242 | 277.076000 |
| 243 | 0.000000 | 243 | 673.830000 |
| 244 | 0.000000 | 244 | 268.024000 |
| 245 | 0.000000 | 245 | 466.636000 |
| 246 | 1.717260 | 246 | 0.000000 |
| 247 | 5.724210 | 247 | 0.000000 |
| 248 | 0.000000 | 248 | 486.722000 |
| 249 | 0.000000 | 249 | 467.862000 |
| 250 | 0.000000 | 250 | 194.934000 |
| 251 | 0.000000 | 251 | 633.372000 |
| 252 | 0.000000 | 252 | 277.832000 |
| 253 | 0.000000 | 253 | 340.358000 |
| 254 | 0.572421 | 254 | 0.000000 |
| 255 | 0.000000 | 255 | 230.018000 |
| 256 | 1.144840 | 256 | 0.000000 |
| 257 | 0.286211 | 257 | 0.000000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|------------|
| 258 | 0.000000 | 258 | 190.786000 |
| 259 | 4.293150 | 259 | 0.000000 |
| 260 | 0.000000 | 260 | 418.066000 |
| 261 | 0.000000 | 261 | 379.590000 |
| 262 | 0.000000 | 262 | 286.884000 |
| 263 | 0.000000 | 263 | 671.378000 |
| 264 | 0.000000 | 264 | 390.624000 |
| 265 | 1.717260 | 265 | 0.000000 |
| 266 | 0.000000 | 266 | 232.470000 |
| 267 | 0.858631 | 267 | 0.000000 |
| 268 | 3.148320 | 268 | 0.000000 |
| 269 | 0.000000 | 269 | 434.004000 |
| 270 | 0.000000 | 270 | 420.048000 |
| 271 | 0.000000 | 271 | 49.040000 |
| 272 | 0.000000 | 272 | 294.996000 |
| 273 | 0.000000 | 273 | 268.024000 |
| 274 | 0.000000 | 274 | 150.328000 |
| 275 | 0.000000 | 275 | 237.374000 |
| 276 | 1.717260 | 276 | 0.000000 |
| 277 | 0.000000 | 277 | 135.616000 |
| 278 | 2.003470 | 278 | 0.000000 |
| 279 | 0.000000 | 279 | 333.002000 |
| 280 | 6.296630 | 280 | 0.000000 |
| 281 | 0.000000 | 281 | 465.880000 |
| 282 | 0.000000 | 282 | 396.754000 |
| 283 | 0.000000 | 283 | 89.498000 |
| 284 | 0.000000 | 284 | 112.322000 |
| 285 | 0.000000 | 285 | 292.544000 |
| 286 | 0.000000 | 286 | 82.898000 |
| 287 | 0.000000 | 287 | 168.718000 |
| 288 | 2.575890 | 288 | 0.000000 |
| 289 | 0.000000 | 289 | 389.398000 |
| 290 | 1.431050 | 290 | 0.000000 |
| 291 | 0.000000 | 291 | 541.892000 |
| 292 | 0.000000 | 292 | 443.342000 |
| 293 | 0.000000 | 293 | 91.950000 |
| 294 | 0.000000 | 294 | 292.544000 |
| 295 | 0.000000 | 295 | 329.324000 |
| 296 | 0.000000 | 296 | 147.876000 |
| 297 | 0.000000 | 297 | 264.346000 |
| 298 | 1.717260 | 298 | 0.000000 |
| 299 | 0.000000 | 299 | 307.256000 |
| 300 | -0.000000 | 300 | 0.000000 |
| 301 | 0.000000 | 301 | 588.480000 |
| 302 | 0.000000 | 302 | 445.794000 |
| 303 | 0.000000 | 303 | 197.386000 |
| 304 | 0.000000 | 304 | 274.154000 |
| 305 | 0.000000 | 305 | 397.980000 |
| 306 | 0.000000 | 306 | 280.284000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|-------------|
| 307 | 2.289680 | 307 | 0.000000 |
| 308 | 1.717260 | 308 | 0.000000 |
| 309 | 0.000000 | 309 | 49.040000 |
| 310 | 2.862110 | 310 | 0.000000 |
| 311 | 0.000000 | 311 | 548.778000 |
| 312 | 0.000000 | 312 | 117.696000 |
| 313 | 0.000000 | 313 | 715.514000 |
| 314 | 0.000000 | 314 | 307.256000 |
| 315 | 0.572421 | 315 | 0.000000 |
| 316 | 0.858631 | 316 | 0.000000 |
| 317 | 4.865580 | 317 | 0.000000 |
| 318 | 0.000000 | 318 | 519.354000 |
| 319 | 0.000000 | 319 | 128.730000 |
| 320 | 0.000000 | 320 | 619.886000 |
| 321 | 0.000000 | 321 | 193.238000 |
| 322 | 0.000000 | 322 | 683.638000 |
| 323 | 0.000000 | 323 | 331.776000 |
| 324 | 1.144840 | 324 | 0.000000 |
| 325 | 2.003470 | 325 | 0.000000 |
| 326 | 0.000000 | 326 | 156.928000 |
| 327 | 0.000000 | 327 | 352.618000 |
| 328 | 0.000000 | 328 | 111.566000 |
| 329 | 0.000000 | 329 | 660.344000 |
| 330 | 0.000000 | 330 | 149.102000 |
| 331 | 0.000000 | 331 | 357.522000 |
| 332 | 1.144840 | 332 | 0.000000 |
| 333 | 0.572421 | 333 | 0.000000 |
| 334 | 0.858631 | 334 | 0.000000 |
| 335 | 0.000000 | 335 | 12.260000 |
| 336 | 8.919976 | 336 | 0.000000 |
| 337 | 0.000000 | 337 | 460.506000 |
| 338 | 0.238764 | 338 | 0.000000 |
| 339 | 0.000000 | 339 | 612.530000 |
| 340 | 0.000000 | 340 | 89.028000 |
| 341 | 0.000000 | 341 | 203.516000 |
| 342 | 3.148320 | 342 | 0.000000 |
| 343 | 0.000000 | 343 | 646.858000 |
| 344 | 0.000000 | 344 | 139.764000 |
| 345 | 0.000000 | 345 | 795.200000 |
| 346 | 0.000000 | 346 | 427.404000 |
| 347 | 0.572421 | 347 | 0.000000 |
| 348 | 0.286211 | 348 | 0.000000 |
| 349 | 0.000000 | 349 | 122.600000 |
| 350 | 2.003470 | 350 | 0.000000 |
| 351 | 0.000000 | 351 | 628.468000 |
| 352 | 0.000000 | 352 | 304.048000 |
| 353 | 0.000000 | 353 | 1262.308000 |
| 354 | 0.000000 | 354 | 586.784000 |
| 355 | 0.000000 | 355 | 115.244000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 356 | 0.000000 | 356 | 723.340000 |
| 357 | 0.000000 | 357 | 648.084000 |
| 358 | -0.000000 | 358 | 0.000000 |
| 359 | 0.000000 | 359 | 770.684000 |
| 360 | 0.000000 | 360 | 455.602000 |
| 361 | 3.720740 | 361 | 0.000000 |
| 362 | 0.000000 | 362 | 50.266000 |
| 363 | 0.000000 | 363 | 489.930000 |
| 364 | 0.000000 | 364 | 110.340000 |
| 365 | 0.000000 | 365 | 675.056000 |
| 366 | 0.000000 | 366 | 254.538000 |
| 367 | 0.000000 | 367 | 320.742000 |
| 368 | 0.000000 | 368 | 648.700000 |
| 369 | 0.000000 | 369 | 556.134000 |
| 370 | 0.000000 | 370 | 584.332000 |
| 371 | 0.000000 | 371 | 737.582000 |
| 372 | 0.000000 | 372 | 407.788000 |
| 373 | 0.000000 | 373 | 508.320000 |
| 374 | 0.000000 | 374 | 296.546000 |
| 375 | 0.000000 | 375 | 643.034000 |
| 376 | 0.000000 | 376 | 795.058000 |
| 377 | 0.000000 | 377 | 1070.908000 |
| 378 | 0.000000 | 378 | 432.162000 |
| 379 | 0.000000 | 379 | 687.170000 |
| 380 | -0.000000 | 380 | 0.000000 |
| 381 | 0.000000 | 381 | 565.332000 |
| 382 | 0.000000 | 382 | 478.896000 |
| 383 | 0.000000 | 383 | 494.834000 |
| 384 | 0.000000 | 384 | 63.282000 |
| 385 | 0.000000 | 385 | 345.262000 |
| 386 | -0.000000 | 386 | 0.000000 |
| 387 | 0.000000 | 387 | 687.932000 |
| 388 | 0.000000 | 388 | 500.964000 |
| 389 | 0.000000 | 389 | 624.790000 |
| 390 | 0.000000 | 390 | 340.358000 |
| 391 | 0.000000 | 391 | 190.786000 |
| 392 | -0.000000 | 392 | 0.000000 |
| 393 | 0.000000 | 393 | 586.174000 |
| 394 | 0.000000 | 394 | 433.534000 |
| 395 | 0.000000 | 395 | 347.714000 |
| 396 | 0.000000 | 396 | 321.968000 |
| 397 | 0.000000 | 397 | 288.110000 |
| 398 | 0.000000 | 398 | 334.228000 |
| 399 | 0.208159 | 399 | 0.000000 |
| 400 | 0.000000 | 400 | 551.846000 |
| 401 | 0.000000 | 401 | 433.534000 |
| 402 | 0.000000 | 402 | 353.844000 |
| 403 | 0.000000 | 403 | 511.998000 |
| 404 | 0.000000 | 404 | 261.894000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|------------|
| 405 | 0.000000 | 405 | 210.872000 |
| 406 | 0.000000 | 406 | 274.154000 |
| 407 | 2.331380 | 407 | 0.000000 |
| 408 | 0.000000 | 408 | 616.824000 |
| 409 | 0.000000 | 409 | 542.648000 |
| 410 | 0.000000 | 410 | 557.360000 |
| 411 | 0.000000 | 411 | 702.028000 |
| 412 | 0.000000 | 412 | 380.816000 |
| 413 | 0.000000 | 413 | 468.332000 |
| 414 | 0.000000 | 414 | 497.286000 |
| 415 | 0.541213 | 415 | 0.000000 |
| 416 | 0.000000 | 416 | 664.638000 |
| 417 | 0.000000 | 417 | 508.320000 |
| 418 | 0.000000 | 418 | 551.230000 |
| 419 | 0.000000 | 419 | 589.236000 |
| 420 | 0.000000 | 420 | 375.912000 |
| 421 | 0.000000 | 421 | 481.348000 |
| 422 | 0.582845 | 422 | 0.000000 |
| 423 | 0.000000 | 423 | 584.948000 |
| 424 | 0.000000 | 424 | 453.150000 |
| 425 | 0.000000 | 425 | 470.314000 |
| 426 | 0.000000 | 426 | 570.846000 |
| 427 | 0.000000 | 427 | 280.754000 |
| 428 | 0.000000 | 428 | 401.658000 |
| 429 | 0.624477 | 429 | 0.000000 |
| 430 | 0.000000 | 430 | 175.464000 |
| 431 | 0.000000 | 431 | 407.788000 |
| 432 | 0.000000 | 432 | 466.636000 |
| 433 | 0.000000 | 433 | 616.208000 |
| 434 | 0.000000 | 434 | 226.340000 |
| 435 | 0.000000 | 435 | 404.110000 |
| 436 | 0.208159 | 436 | 0.000000 |
| 437 | 0.000000 | 437 | 761.492000 |
| 438 | 0.000000 | 438 | 590.462000 |
| 439 | 0.000000 | 439 | 369.782000 |
| 440 | 0.000000 | 440 | 735.130000 |
| 441 | 0.000000 | 441 | 363.652000 |
| 442 | 0.000000 | 442 | 328.098000 |
| 443 | 1.082430 | 443 | 0.000000 |
| 444 | 0.000000 | 444 | 592.304000 |
| 445 | 0.000000 | 445 | 487.478000 |
| 446 | 0.000000 | 446 | 466.636000 |
| 447 | 0.000000 | 447 | 666.474000 |
| 448 | 0.000000 | 448 | 323.194000 |
| 449 | 0.000000 | 449 | 404.110000 |
| 450 | 0.374686 | 450 | 0.000000 |
| 451 | 0.000000 | 451 | 615.598000 |
| 452 | 0.000000 | 452 | 482.574000 |
| 453 | 0.000000 | 453 | 399.206000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 454 | 0.000000 | 454 | 704.480000 |
| 455 | 0.000000 | 455 | 309.708000 |
| 456 | 0.000000 | 456 | 313.386000 |
| 457 | 5.079080 | 457 | 0.000000 |
| 458 | 0.000000 | 458 | 108.034000 |
| 459 | 0.000000 | 459 | 331.776000 |
| 460 | 0.000000 | 460 | 541.422000 |
| 461 | 0.000000 | 461 | 563.490000 |
| 462 | 0.000000 | 462 | 112.322000 |
| 463 | 0.000000 | 463 | 418.822000 |
| 464 | 0.083264 | 464 | 0.000000 |
| 465 | 0.000000 | 465 | 434.150000 |
| 466 | 0.000000 | 466 | 500.964000 |
| 467 | 0.000000 | 467 | 487.478000 |
| 468 | 0.000000 | 468 | 644.406000 |
| 469 | 0.000000 | 469 | 220.210000 |
| 470 | 0.000000 | 470 | 390.624000 |
| 471 | -0.000000 | 471 | 0.000000 |
| 472 | 0.000000 | 472 | 180.978000 |
| 473 | 0.041632 | 473 | 0.000000 |
| 474 | 0.000000 | 474 | 512.614000 |
| 475 | 0.000000 | 475 | 532.840000 |
| 476 | 0.000000 | 476 | 303.578000 |
| 477 | 0.000000 | 477 | 731.452000 |
| 478 | 0.000000 | 478 | 470.314000 |
| 479 | 0.000000 | 479 | 244.730000 |
| 480 | 0.083264 | 480 | 0.000000 |
| 481 | 0.000000 | 481 | 822.792000 |
| 482 | 0.000000 | 482 | 500.964000 |
| 483 | 0.000000 | 483 | 220.210000 |
| 484 | 0.000000 | 484 | 397.980000 |
| 485 | 0.000000 | 485 | 372.234000 |
| 486 | 0.000000 | 486 | 150.328000 |
| 487 | 0.000000 | 487 | 5085.809592 |
| 488 | 0.249791 | 488 | 0.000000 |
| 489 | 0.000000 | 489 | 241.668000 |
| 490 | 0.000000 | 490 | 469.088000 |
| 491 | 0.000000 | 491 | 227.566000 |
| 492 | 0.000000 | 492 | 627.242000 |
| 493 | 0.000000 | 493 | 231.244000 |
| 494 | 0.000000 | 494 | 4921.995592 |
| 495 | 0.000000 | 495 | 5611.153592 |
| 496 | 0.000000 | 496 | 5400.891592 |
| 497 | 0.000000 | 497 | 5221.895592 |
| 498 | 0.000000 | 498 | 5284.421592 |
| 499 | 0.000000 | 499 | 5251.319592 |
| 500 | 0.000000 | 500 | 5121.363592 |
| 501 | 0.041632 | 501 | 0.000000 |
| 502 | 0.000000 | 502 | 660.960000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 503 | 0.000000 | 503 | 481.348000 |
| 504 | 0.000000 | 504 | 247.182000 |
| 505 | 0.000000 | 505 | 363.652000 |
| 506 | 0.000000 | 506 | 216.532000 |
| 507 | 0.000000 | 507 | 5426.027592 |
| 508 | 0.000000 | 508 | 5278.291592 |
| 509 | 0.333054 | 509 | 0.000000 |
| 510 | 0.000000 | 510 | 345.878000 |
| 511 | 0.000000 | 511 | 483.800000 |
| 512 | 0.000000 | 512 | 453.150000 |
| 513 | 0.000000 | 513 | 623.564000 |
| 514 | 0.000000 | 514 | 294.996000 |
| 515 | 0.000000 | 515 | 355.070000 |
| 516 | -0.000000 | 516 | 0.000000 |
| 517 | 0.000000 | 517 | 274.154000 |
| 518 | 0.041632 | 518 | 0.000000 |
| 519 | 0.000000 | 519 | 580.044000 |
| 520 | 0.000000 | 520 | 438.438000 |
| 521 | 0.000000 | 521 | 299.900000 |
| 522 | 0.000000 | 522 | 700.802000 |
| 523 | 0.000000 | 523 | 299.900000 |
| 524 | 0.000000 | 524 | 236.148000 |
| 525 | 0.000000 | 525 | 5189.263592 |
| 526 | 0.000000 | 526 | 5437.061592 |
| 527 | 0.000000 | 527 | 5675.515592 |
| 528 | 0.000000 | 528 | 5319.975592 |
| 529 | 0.000000 | 529 | 5611.763592 |
| 530 | 0.000000 | 530 | 5419.281592 |
| 531 | 0.249791 | 531 | 0.000000 |
| 532 | 0.000000 | 532 | 5139.753592 |
| 533 | 0.083264 | 533 | 0.000000 |
| 534 | 0.000000 | 534 | 5205.957592 |
| 535 | 0.000000 | 535 | 5096.843592 |
| 536 | 0.124895 | 536 | 0.000000 |
| 537 | 0.291423 | 537 | 0.000000 |
| 538 | 0.000000 | 538 | 591.078000 |
| 539 | 0.000000 | 539 | 497.286000 |
| 540 | 0.000000 | 540 | 589.236000 |
| 541 | 0.000000 | 541 | 557.360000 |
| 542 | 0.000000 | 542 | 378.364000 |
| 543 | 0.000000 | 543 | 529.162000 |
| 544 | 0.000000 | 544 | 4784.683592 |
| 545 | 0.000000 | 545 | 5201.669592 |
| 546 | 0.000000 | 546 | 5150.787592 |
| 547 | 0.000000 | 547 | 5324.879592 |
| 548 | 0.000000 | 548 | 5405.795592 |
| 549 | 0.000000 | 549 | 4919.073592 |
| 550 | 0.000000 | 550 | 5092.409592 |
| 551 | 0.000000 | 551 | 5241.511592 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|------------|
| 552 | 0.749372 | 552 | 0.000000 |
| 553 | 0.000000 | 553 | 540.812000 |
| 554 | 0.000000 | 554 | 453.150000 |
| 555 | 0.000000 | 555 | 475.218000 |
| 556 | 0.000000 | 556 | 813.594000 |
| 557 | 0.000000 | 557 | 344.036000 |
| 558 | 0.000000 | 558 | 379.590000 |
| 559 | 0.041632 | 559 | 0.000000 |
| 560 | 0.000000 | 560 | 211.628000 |
| 561 | 0.291423 | 561 | 0.000000 |
| 562 | 0.000000 | 562 | 412.082000 |
| 563 | 0.000000 | 563 | 359.974000 |
| 564 | 0.000000 | 564 | 486.252000 |
| 565 | 0.000000 | 565 | 657.892000 |
| 566 | 0.000000 | 566 | 135.616000 |
| 567 | 0.000000 | 567 | 459.280000 |
| 568 | 0.999163 | 568 | 0.000000 |
| 569 | 0.000000 | 569 | 681.802000 |
| 570 | 0.000000 | 570 | 502.190000 |
| 571 | 0.000000 | 571 | 458.054000 |
| 572 | 0.000000 | 572 | 779.266000 |
| 573 | 0.000000 | 573 | 340.358000 |
| 574 | 0.000000 | 574 | 409.014000 |
| 575 | 0.457950 | 575 | 0.000000 |
| 576 | 0.000000 | 576 | 573.914000 |
| 577 | 0.000000 | 577 | 252.086000 |
| 578 | 0.000000 | 578 | 497.286000 |
| 579 | 0.000000 | 579 | 568.394000 |
| 580 | 0.000000 | 580 | 180.978000 |
| 581 | 0.000000 | 581 | 310.178000 |
| 582 | 0.000000 | 582 | 470.314000 |
| 583 | 0.124895 | 583 | 0.000000 |
| 584 | 0.166527 | 584 | 0.000000 |
| 585 | 0.000000 | 585 | 608.242000 |
| 586 | 0.000000 | 586 | 402.884000 |
| 587 | 0.000000 | 587 | 476.444000 |
| 588 | 0.000000 | 588 | 523.032000 |
| 589 | 0.000000 | 589 | 276.606000 |
| 590 | 0.000000 | 590 | 240.296000 |
| 591 | 0.000000 | 591 | 496.060000 |
| 592 | 0.915900 | 592 | 0.000000 |
| 593 | 0.000000 | 593 | 318.906000 |
| 594 | 0.000000 | 594 | 386.946000 |
| 595 | 0.000000 | 595 | 576.976000 |
| 596 | 0.000000 | 596 | 673.830000 |
| 597 | 0.000000 | 597 | 268.024000 |
| 598 | 0.000000 | 598 | 581.880000 |
| 599 | 0.124895 | 599 | 0.000000 |
| 600 | 0.291423 | 600 | 0.000000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 601 | 0.000000 | 601 | 583.722000 |
| 602 | 0.000000 | 602 | 467.862000 |
| 603 | 0.000000 | 603 | 494.834000 |
| 604 | 0.000000 | 604 | 633.372000 |
| 605 | 0.000000 | 605 | 277.832000 |
| 606 | 0.000000 | 606 | 455.602000 |
| 607 | -0.000000 | 607 | 0.000000 |
| 608 | 0.000000 | 608 | 230.018000 |
| 609 | 0.000000 | 609 | 4913.413592 |
| 610 | -0.000000 | 610 | 0.000000 |
| 611 | 0.000000 | 611 | 190.786000 |
| 612 | 0.249790 | 612 | 0.000000 |
| 613 | 0.000000 | 613 | 515.066000 |
| 614 | 0.000000 | 614 | 379.590000 |
| 615 | 0.000000 | 615 | 586.784000 |
| 616 | 0.000000 | 616 | 671.378000 |
| 617 | 0.000000 | 617 | 505.868000 |
| 618 | -0.000000 | 618 | 0.000000 |
| 619 | 0.000000 | 619 | 232.470000 |
| 620 | 0.041632 | 620 | 0.000000 |
| 621 | 0.208159 | 621 | 0.000000 |
| 622 | 0.000000 | 622 | 531.004000 |
| 623 | 0.000000 | 623 | 420.048000 |
| 624 | 0.000000 | 624 | 348.940000 |
| 625 | 0.000000 | 625 | 294.996000 |
| 626 | 0.000000 | 626 | 268.024000 |
| 627 | -0.000000 | 627 | 0.000000 |
| 628 | 0.000000 | 628 | 352.618000 |
| 629 | -0.000000 | 629 | 0.000000 |
| 630 | 0.000000 | 630 | 135.616000 |
| 631 | -0.000000 | 631 | 0.000000 |
| 632 | 0.000000 | 632 | 333.002000 |
| 633 | 0.000000 | 633 | 4978.391592 |
| 634 | 0.000000 | 634 | 5541.271592 |
| 635 | 0.000000 | 635 | 5375.145592 |
| 636 | 0.000000 | 636 | 5367.789592 |
| 637 | 0.000000 | 637 | 5090.713592 |
| 638 | 0.000000 | 638 | 5270.935592 |
| 639 | 0.000000 | 639 | 4910.961592 |
| 640 | 0.000000 | 640 | 5262.353592 |
| 641 | 0.208159 | 641 | 0.000000 |
| 642 | 0.000000 | 642 | 389.398000 |
| 643 | 0.000000 | 643 | 4937.933592 |
| 644 | 0.000000 | 644 | 5576.825592 |
| 645 | 0.000000 | 645 | 5381.275592 |
| 646 | 0.000000 | 646 | 5329.783592 |
| 647 | 0.000000 | 647 | 5230.477592 |
| 648 | 0.000000 | 648 | 5267.257592 |
| 649 | 0.000000 | 649 | 4935.481592 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|-------------|
| 650 | 0.000000 | 650 | 5317.523592 |
| 651 | 0.041632 | 651 | 0.000000 |
| 652 | 0.000000 | 652 | 307.256000 |
| 653 | 0.000000 | 653 | 150.328000 |
| 654 | 0.000000 | 654 | 835.808000 |
| 655 | 0.000000 | 655 | 596.122000 |
| 656 | 0.000000 | 656 | 647.614000 |
| 657 | 0.000000 | 657 | 424.482000 |
| 658 | 0.000000 | 658 | 548.308000 |
| 659 | 0.000000 | 659 | 545.856000 |
| 660 | 0.333054 | 660 | 0.000000 |
| 661 | 1.165690 | 661 | 0.000000 |
| 662 | 0.707741 | 662 | 0.000000 |
| 663 | 0.000000 | 663 | 47.960000 |
| 664 | 0.000000 | 664 | 499.738000 |
| 665 | 0.000000 | 665 | 368.556000 |
| 666 | 0.000000 | 666 | 666.474000 |
| 667 | 0.000000 | 667 | 373.460000 |
| 668 | 1.498740 | 668 | 0.000000 |
| 669 | 1.457110 | 669 | 0.000000 |
| 670 | 2.997490 | 670 | 0.000000 |
| 671 | 0.000000 | 671 | 519.354000 |
| 672 | 0.000000 | 672 | 428.630000 |
| 673 | 0.000000 | 673 | 619.886000 |
| 674 | 0.000000 | 674 | 193.238000 |
| 675 | 0.000000 | 675 | 533.310000 |
| 676 | 0.000000 | 676 | 447.020000 |
| 677 | 0.333054 | 677 | 0.000000 |
| 678 | 2.164850 | 678 | 0.000000 |
| 679 | 0.000000 | 679 | 253.928000 |
| 680 | 0.000000 | 680 | 352.618000 |
| 681 | 0.000000 | 681 | 411.466000 |
| 682 | 0.000000 | 682 | 660.344000 |
| 683 | 0.000000 | 683 | 149.102000 |
| 684 | 0.000000 | 684 | 472.766000 |
| 685 | 1.540380 | 685 | 0.000000 |
| 686 | 0.333054 | 686 | 0.000000 |
| 687 | 1.290590 | 687 | 0.000000 |
| 688 | 1.165690 | 688 | 0.000000 |
| 689 | 0.000000 | 689 | 84.740000 |
| 690 | 0.000000 | 690 | 448.246000 |
| 691 | 0.000000 | 691 | 287.640000 |
| 692 | 0.000000 | 692 | 600.270000 |
| 693 | 0.000000 | 693 | 192.012000 |
| 694 | 0.000000 | 694 | 106.516000 |
| 695 | 0.915900 | 695 | 0.000000 |
| 696 | 0.000000 | 696 | 549.858000 |
| 697 | 0.000000 | 697 | 342.664000 |
| 698 | 0.000000 | 698 | 698.200000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 699 | 0.000000 | 699 | 445.648000 |
| 700 | 1.540380 | 700 | 0.000000 |
| 701 | 0.000000 | 701 | 5405.795592 |
| 702 | 0.000000 | 702 | 25.600000 |
| 703 | 4.121550 | 703 | 0.000000 |
| 704 | 0.000000 | 704 | 531.468000 |
| 705 | 0.000000 | 705 | 506.948000 |
| 706 | 0.000000 | 706 | 1165.308000 |
| 707 | 0.000000 | 707 | 605.028000 |
| 708 | -0.000000 | 708 | 0.000000 |
| 709 | 0.000000 | 709 | 705.096000 |
| 710 | 0.000000 | 710 | 532.840000 |
| 711 | 0.000000 | 711 | 184.656000 |
| 712 | 0.000000 | 712 | 655.440000 |
| 713 | 0.000000 | 713 | 340.358000 |
| 714 | 0.791004 | 714 | 0.000000 |
| 715 | 0.000000 | 715 | 147.266000 |
| 716 | 0.000000 | 716 | 489.930000 |
| 717 | 0.000000 | 717 | 410.240000 |
| 718 | 0.000000 | 718 | 675.056000 |
| 719 | 0.000000 | 719 | 254.538000 |
| 720 | 0.000000 | 720 | 435.986000 |
| 721 | 0.000000 | 721 | 496.826000 |
| 722 | 0.000000 | 722 | 228.898000 |
| 723 | 0.432363 | 723 | 0.000000 |
| 724 | 0.000000 | 724 | 254.564000 |
| 725 | 0.000000 | 725 | 208.240000 |
| 726 | 0.000000 | 726 | 54.244000 |
| 727 | 0.000000 | 727 | 101.820000 |
| 728 | 0.000000 | 728 | 165.672000 |
| 729 | 2.767117 | 729 | 0.000000 |
| 730 | 0.000000 | 730 | 317.164000 |
| 731 | 0.000000 | 731 | 113.088000 |
| 732 | 0.000000 | 732 | 37.968000 |
| 733 | 0.000000 | 733 | 111.836000 |
| 734 | 0.000000 | 734 | 508.094000 |
| 735 | -0.000000 | 735 | 0.000000 |
| 736 | 0.000000 | 736 | 184.452000 |
| 737 | 0.000000 | 737 | 86.170000 |
| 738 | 0.000000 | 738 | 24.822000 |
| 739 | 0.000000 | 739 | 297.132000 |
| 740 | 0.000000 | 740 | 755.990000 |
| 741 | 0.000000 | 741 | 439.860000 |
| 742 | 0.000000 | 742 | 436.104000 |
| 743 | 0.000000 | 743 | 412.942000 |
| 744 | 0.000000 | 744 | 131.242000 |
| 745 | 0.000000 | 745 | 178.818000 |
| 746 | 0.000000 | 746 | 585.718000 |
| 747 | 0.000000 | 747 | 287.116000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|------------|
| 748 | 0.144121 | 748 | 0.000000 |
| 749 | 0.000000 | 749 | 285.238000 |
| 750 | 0.000000 | 750 | 202.824000 |
| 751 | 0.000000 | 751 | 86.170000 |
| 752 | 0.000000 | 752 | 175.688000 |
| 753 | 0.000000 | 753 | 565.060000 |
| 754 | 0.000000 | 754 | 283.986000 |
| 755 | 0.490010 | 755 | 0.000000 |
| 756 | 0.000000 | 756 | 257.068000 |
| 757 | 0.000000 | 757 | 251.434000 |
| 758 | 0.000000 | 758 | 160.256000 |
| 759 | 0.000000 | 759 | 52.366000 |
| 760 | 0.000000 | 760 | 71.772000 |
| 761 | 0.000000 | 761 | 494.322000 |
| 762 | 0.000000 | 762 | 235.784000 |
| 763 | 2.997710 | 763 | 0.000000 |
| 764 | 0.000000 | 764 | 250.182000 |
| 765 | 0.000000 | 765 | 208.240000 |
| 766 | 0.000000 | 766 | 187.800000 |
| 767 | 0.000000 | 767 | 62.382000 |
| 768 | 0.000000 | 768 | 74.902000 |
| 769 | 0.000000 | 769 | 521.866000 |
| 770 | 0.000000 | 770 | 221.386000 |
| 771 | 1.239440 | 771 | 0.000000 |
| 772 | 0.000000 | 772 | 195.720000 |
| 773 | 0.000000 | 773 | 208.866000 |
| 774 | 0.000000 | 774 | 57.374000 |
| 775 | 0.000000 | 775 | 116.218000 |
| 776 | 0.000000 | 776 | 522.492000 |
| 777 | 0.000000 | 777 | 234.532000 |
| 778 | 0.576483 | 778 | 0.000000 |
| 779 | 0.000000 | 779 | 227.646000 |
| 780 | 0.000000 | 780 | 136.468000 |
| 781 | 0.000000 | 781 | 58.000000 |
| 782 | 0.000000 | 782 | 118.096000 |
| 783 | 0.000000 | 783 | 315.286000 |
| 784 | 0.000000 | 784 | 213.248000 |
| 785 | 0.201769 | 785 | 0.000000 |
| 786 | 0.000000 | 786 | 252.686000 |
| 787 | 0.000000 | 787 | 175.688000 |
| 788 | 0.000000 | 788 | 61.130000 |
| 789 | 0.000000 | 789 | 167.550000 |
| 790 | 0.000000 | 790 | 663.968000 |
| 791 | 0.000000 | 791 | 355.976000 |
| 792 | 0.230593 | 792 | 0.000000 |
| 793 | 0.000000 | 793 | 362.862000 |
| 794 | 0.000000 | 794 | 295.254000 |
| 795 | 0.000000 | 795 | 71.772000 |
| 796 | 0.000000 | 796 | 118.096000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|------------|
| 797 | 0.000000 | 797 | 528.126000 |
| 798 | 0.000000 | 798 | 253.938000 |
| 799 | 1.498860 | 799 | 0.000000 |
| 800 | 0.000000 | 800 | 278.352000 |
| 801 | 0.000000 | 801 | 225.142000 |
| 802 | 0.000000 | 802 | 61.130000 |
| 803 | 0.000000 | 803 | 152.526000 |
| 804 | 0.000000 | 804 | 574.450000 |
| 805 | 0.000000 | 805 | 285.864000 |
| 806 | 0.778252 | 806 | 0.000000 |
| 807 | 0.000000 | 807 | 332.188000 |
| 808 | 0.000000 | 808 | 252.686000 |
| 809 | 0.000000 | 809 | 49.236000 |
| 810 | 0.000000 | 810 | 79.910000 |
| 811 | 0.000000 | 811 | 242.670000 |
| 812 | 0.000000 | 812 | 136.250000 |
| 813 | 1.297090 | 813 | 0.000000 |
| 814 | 0.000000 | 814 | 187.582000 |
| 815 | 0.000000 | 815 | 79.284000 |
| 816 | 0.000000 | 816 | 30.456000 |
| 817 | 0.000000 | 817 | 107.454000 |
| 818 | 0.000000 | 818 | 436.730000 |
| 819 | 0.000000 | 819 | 250.182000 |
| 820 | 0.230593 | 820 | 0.000000 |
| 821 | 0.000000 | 821 | 256.442000 |
| 822 | 0.000000 | 822 | 161.916000 |
| 823 | 0.000000 | 823 | 43.602000 |
| 824 | 0.000000 | 824 | 170.898000 |
| 825 | 0.144121 | 825 | 0.000000 |
| 826 | 0.000000 | 826 | 201.354000 |
| 827 | 0.000000 | 827 | 570.694000 |
| 828 | 0.000000 | 828 | 360.358000 |
| 829 | 0.201769 | 829 | 0.000000 |
| 830 | 0.000000 | 830 | 394.788000 |
| 831 | 0.000000 | 831 | 383.520000 |
| 832 | 0.000000 | 832 | 63.008000 |
| 833 | 0.000000 | 833 | 243.922000 |
| 834 | 0.000000 | 834 | 771.640000 |
| 835 | 0.000000 | 835 | 386.650000 |
| 836 | 0.518834 | 836 | 0.000000 |
| 837 | 0.000000 | 837 | 267.084000 |
| 838 | 0.000000 | 838 | 376.008000 |
| 839 | 0.000000 | 839 | 57.374000 |
| 840 | 0.057648 | 840 | 0.000000 |
| 841 | 0.000000 | 841 | 240.166000 |
| 842 | 0.000000 | 842 | 471.160000 |
| 843 | 0.000000 | 843 | 366.618000 |
| 844 | 0.230593 | 844 | 0.000000 |
| 845 | 0.000000 | 845 | 380.390000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|-------------|
| 846 | 0.000000 | 846 | 94.934000 |
| 847 | 0.000000 | 847 | 203.232000 |
| 848 | 0.000000 | 848 | 662.716000 |
| 849 | 0.000000 | 849 | 334.692000 |
| 850 | 1.095320 | 850 | 0.000000 |
| 851 | 0.000000 | 851 | 208.240000 |
| 852 | 0.000000 | 852 | 313.408000 |
| 853 | 0.000000 | 853 | 41.724000 |
| 854 | 0.000000 | 854 | 230.150000 |
| 855 | 0.000000 | 855 | 675.236000 |
| 856 | 0.000000 | 856 | 362.862000 |
| 857 | 0.691779 | 857 | 0.000000 |
| 858 | 0.000000 | 858 | 235.784000 |
| 859 | 0.000000 | 859 | 77.406000 |
| 860 | 0.028824 | 860 | 0.000000 |
| 861 | 0.000000 | 861 | 2852.471265 |
| 862 | 0.000000 | 862 | 124.982000 |
| 863 | 0.000000 | 863 | 409.186000 |
| 864 | 0.000000 | 864 | 258.946000 |
| 865 | 0.201769 | 865 | 0.000000 |
| 866 | 0.000000 | 866 | 263.328000 |
| 867 | 0.000000 | 867 | 217.630000 |
| 868 | 0.000000 | 868 | 42.976000 |
| 869 | 0.000000 | 869 | 40.064000 |
| 870 | 0.086472 | 870 | 0.000000 |
| 871 | 0.000000 | 871 | 203.232000 |
| 872 | 0.000000 | 872 | 607.002000 |
| 873 | 0.000000 | 873 | 314.034000 |
| 874 | 0.345890 | 874 | 0.000000 |
| 875 | 0.000000 | 875 | 381.016000 |
| 876 | 0.000000 | 876 | 298.384000 |
| 877 | 0.000000 | 877 | 60.504000 |
| 878 | 0.000000 | 878 | 3163.375265 |
| 879 | 0.000000 | 879 | 3397.499265 |
| 880 | 0.000000 | 880 | 3298.591265 |
| 881 | 0.000000 | 881 | 2873.755265 |
| 882 | 0.000000 | 882 | 3199.057265 |
| 883 | 0.000000 | 883 | 3017.517265 |
| 884 | 0.172945 | 884 | 0.000000 |
| 885 | 0.317065 | 885 | 0.000000 |
| 886 | 0.115297 | 886 | 0.000000 |
| 887 | 0.144121 | 887 | 0.000000 |
| 888 | 0.000000 | 888 | 2759.823265 |
| 889 | 0.028824 | 889 | 0.000000 |
| 890 | 0.000000 | 890 | 55.496000 |
| 891 | 0.000000 | 891 | 464.900000 |
| 892 | 0.000000 | 892 | 196.346000 |
| 893 | 0.086472 | 893 | 0.000000 |
| 894 | 0.000000 | 894 | 160.038000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|------------|
| 895 | 0.000000 | 895 | 190.712000 |
| 896 | 0.000000 | 896 | 62.382000 |
| 897 | 0.000000 | 897 | 80.536000 |
| 898 | 0.000000 | 898 | 401.048000 |
| 899 | 0.000000 | 899 | 154.404000 |
| 900 | 0.518834 | 900 | 0.000000 |
| 901 | 0.000000 | 901 | 217.630000 |
| 902 | 0.000000 | 902 | 91.178000 |
| 903 | 0.000000 | 903 | 114.558000 |
| 904 | 0.000000 | 904 | 50.488000 |
| 905 | 0.000000 | 905 | 113.714000 |
| 906 | 0.000000 | 906 | 497.452000 |
| 907 | 0.000000 | 907 | 232.028000 |
| 908 | 0.778252 | 908 | 0.000000 |
| 909 | 0.000000 | 909 | 349.090000 |
| 910 | 0.000000 | 910 | 231.402000 |
| 911 | 0.000000 | 911 | 44.228000 |
| 912 | 0.086472 | 912 | 0.000000 |
| 913 | 0.000000 | 913 | 50.080000 |
| 914 | 0.000000 | 914 | 108.080000 |
| 915 | 0.000000 | 915 | 426.088000 |
| 916 | 0.000000 | 916 | 178.818000 |
| 917 | 0.201769 | 917 | 0.000000 |
| 918 | 0.000000 | 918 | 263.954000 |
| 919 | 0.000000 | 919 | 119.348000 |
| 920 | 0.000000 | 920 | 79.284000 |
| 921 | 0.000000 | 921 | 122.478000 |
| 922 | 0.000000 | 922 | 578.206000 |
| 923 | 0.000000 | 923 | 265.832000 |
| 924 | 1.297090 | 924 | 0.000000 |
| 925 | 0.000000 | 925 | 340.326000 |
| 926 | 0.000000 | 926 | 238.288000 |
| 927 | 0.000000 | 927 | 68.016000 |
| 928 | 0.000000 | 928 | 102.446000 |
| 929 | 0.000000 | 929 | 503.086000 |
| 930 | 0.000000 | 930 | 118.096000 |
| 931 | 0.201769 | 931 | 0.000000 |
| 932 | 0.000000 | 932 | 212.622000 |
| 933 | 0.000000 | 933 | 136.876000 |
| 934 | 0.000000 | 934 | 137.720000 |
| 935 | 0.000000 | 935 | 79.284000 |
| 936 | 0.086472 | 936 | 0.000000 |
| 937 | 0.000000 | 937 | 113.088000 |
| 938 | 0.000000 | 938 | 531.256000 |
| 939 | 0.000000 | 939 | 205.736000 |
| 940 | 0.201769 | 940 | 0.000000 |
| 941 | 0.000000 | 941 | 200.102000 |
| 942 | 0.000000 | 942 | 196.346000 |
| 943 | 0.000000 | 943 | 112.680000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 944 | 0.000000 | 944 | 103.072000 |
| 945 | 0.000000 | 945 | 61.756000 |
| 946 | 0.000000 | 946 | 332.188000 |
| 947 | 0.000000 | 947 | 146.266000 |
| 948 | 0.230593 | 948 | 0.000000 |
| 949 | 0.000000 | 949 | 225.768000 |
| 950 | 0.000000 | 950 | 140.632000 |
| 951 | 0.000000 | 951 | 95.560000 |
| 952 | 0.057648 | 952 | 0.000000 |
| 953 | 0.000000 | 953 | 103.698000 |
| 954 | 0.000000 | 954 | 509.346000 |
| 955 | 0.000000 | 955 | 229.524000 |
| 956 | 0.345890 | 956 | 0.000000 |
| 957 | 0.000000 | 957 | 247.052000 |
| 958 | 0.000000 | 958 | 187.582000 |
| 959 | 0.000000 | 959 | 73.024000 |
| 960 | 0.000000 | 960 | 62.600000 |
| 961 | -0.000000 | 961 | 0.000000 |
| 962 | 0.000000 | 962 | 3022.525265 |
| 963 | 0.000000 | 963 | 82.632000 |
| 964 | -0.000000 | 964 | 0.000000 |
| 965 | 0.000000 | 965 | 56.748000 |
| 966 | 0.000000 | 966 | 427.340000 |
| 967 | 0.000000 | 967 | 137.502000 |
| 968 | 0.605306 | 968 | 0.000000 |
| 969 | 0.000000 | 969 | 219.508000 |
| 970 | 0.000000 | 970 | 51.740000 |
| 971 | 0.000000 | 971 | 61.348000 |
| 972 | -0.000000 | 972 | 0.000000 |
| 973 | 0.000000 | 973 | 2987.469265 |
| 974 | 0.000000 | 974 | 178.192000 |
| 975 | 0.000000 | 975 | 556.922000 |
| 976 | 0.000000 | 976 | 279.604000 |
| 977 | 0.518834 | 977 | 0.000000 |
| 978 | 0.000000 | 978 | 148.770000 |
| 979 | 0.000000 | 979 | 257.068000 |
| 980 | 0.000000 | 980 | 55.088000 |
| 981 | 0.000000 | 981 | 94.934000 |
| 982 | 0.000000 | 982 | 110.802000 |
| 983 | -0.000000 | 983 | 0.000000 |
| 984 | 0.000000 | 984 | 10.016000 |
| 985 | 0.057648 | 985 | 0.000000 |
| 986 | 0.000000 | 986 | 157.534000 |
| 987 | 0.000000 | 987 | 552.540000 |
| 988 | 0.000000 | 988 | 247.052000 |
| 989 | 0.403538 | 989 | 0.000000 |
| 990 | 0.000000 | 990 | 34.838000 |
| 991 | 0.000000 | 991 | 248.930000 |
| 992 | -0.000000 | 992 | 0.000000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 993 | 0.000000 | 993 | 39.220000 |
| 994 | 0.115297 | 994 | 0.000000 |
| 995 | 0.000000 | 995 | 18.780000 |
| 996 | 0.000000 | 996 | 3035.045265 |
| 997 | 0.000000 | 997 | 3468.863265 |
| 998 | 0.000000 | 998 | 3148.351265 |
| 999 | 0.000000 | 999 | 2878.763265 |
| 1000 | 0.000000 | 1000 | 3004.371265 |
| 1001 | 0.000000 | 1001 | 3145.221265 |
| 1002 | 0.000000 | 1002 | 2910.689265 |
| 1003 | 0.000000 | 1003 | 2965.559265 |
| 1004 | 0.000000 | 1004 | 23.162000 |
| 1005 | -0.000000 | 1005 | 0.000000 |
| 1006 | 0.000000 | 1006 | 198.632000 |
| 1007 | 0.000000 | 1007 | 656.238000 |
| 1008 | 0.000000 | 1008 | 313.190000 |
| 1009 | 0.000000 | 1009 | 96.186000 |
| 1010 | 0.000000 | 1010 | 158.568000 |
| 1011 | 0.000000 | 1011 | 343.864000 |
| 1012 | 0.000000 | 1012 | 137.284000 |
| 1013 | 0.230593 | 1013 | 0.000000 |
| 1014 | 0.461186 | 1014 | 0.000000 |
| 1015 | 0.000000 | 1015 | 168.176000 |
| 1016 | 0.000000 | 1016 | 300.262000 |
| 1017 | 0.000000 | 1017 | 310.278000 |
| 1018 | 0.230593 | 1018 | 0.000000 |
| 1019 | 0.000000 | 1019 | 328.432000 |
| 1020 | 0.000000 | 1020 | 95.560000 |
| 1021 | 0.288241 | 1021 | 0.000000 |
| 1022 | 0.403538 | 1022 | 0.000000 |
| 1023 | 0.000000 | 1023 | 137.502000 |
| 1024 | 0.000000 | 1024 | 289.620000 |
| 1025 | 2.363580 | 1025 | 0.000000 |
| 1026 | 0.000000 | 1026 | 273.970000 |
| 1027 | 0.000000 | 1027 | 178.192000 |
| 1028 | 0.000000 | 1028 | 286.708000 |
| 1029 | 0.000000 | 1029 | 102.446000 |
| 1030 | 0.259417 | 1030 | 0.000000 |
| 1031 | 0.000000 | 1031 | 146.266000 |
| 1032 | 0.000000 | 1032 | 383.520000 |
| 1033 | 0.000000 | 1033 | 213.248000 |
| 1034 | 0.345890 | 1034 | 0.000000 |
| 1035 | 0.000000 | 1035 | 303.392000 |
| 1036 | 0.000000 | 1036 | 164.420000 |
| 1037 | 0.000000 | 1037 | 124.356000 |
| 1038 | 0.605307 | 1038 | 0.000000 |
| 1039 | 0.000000 | 1039 | 3471.367265 |
| 1040 | 0.201769 | 1040 | 0.000000 |
| 1041 | 0.000000 | 1041 | 209.492000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 1042 | 0.000000 | 1042 | 360.358000 |
| 1043 | 0.000000 | 1043 | 325.302000 |
| 1044 | 0.807076 | 1044 | 0.000000 |
| 1045 | 0.000000 | 1045 | 335.944000 |
| 1046 | 0.000000 | 1046 | 44.228000 |
| 1047 | 0.000000 | 1047 | 235.784000 |
| 1048 | 0.000000 | 1048 | 288.994000 |
| 1049 | 0.000000 | 1049 | 349.090000 |
| 1050 | 0.807076 | 1050 | 0.000000 |
| 1051 | 0.000000 | 1051 | 357.854000 |
| 1052 | 0.000000 | 1052 | 145.640000 |
| 1053 | 0.144121 | 1053 | 0.000000 |
| 1054 | 0.000000 | 1054 | 2917.575265 |
| 1055 | 0.000000 | 1055 | 110.584000 |
| 1056 | 0.000000 | 1056 | 205.110000 |
| 1057 | 0.000000 | 1057 | 255.816000 |
| 1058 | 0.634131 | 1058 | 0.000000 |
| 1059 | 0.000000 | 1059 | 512.476000 |
| 1060 | 0.000000 | 1060 | 143.136000 |
| 1061 | 0.000000 | 1061 | 262.076000 |
| 1062 | 0.000000 | 1062 | 729.698000 |
| 1063 | 0.000000 | 1063 | 421.080000 |
| 1064 | 0.144121 | 1064 | 0.000000 |
| 1065 | 0.000000 | 1065 | 416.698000 |
| 1066 | 0.000000 | 1066 | 377.886000 |
| 1067 | 0.000000 | 1067 | 146.892000 |
| 1068 | 0.000000 | 1068 | 329.684000 |
| 1069 | 0.000000 | 1069 | 283.986000 |
| 1070 | 0.172945 | 1070 | 0.000000 |
| 1071 | 0.000000 | 1071 | 311.530000 |
| 1072 | 0.000000 | 1072 | 218.882000 |
| 1073 | 0.000000 | 1073 | 106.202000 |
| 1074 | 0.000000 | 1074 | 975.426000 |
| 1075 | 0.000000 | 1075 | 450.698000 |
| 1076 | 1.337527 | 1076 | 0.000000 |
| 1077 | 0.000000 | 1077 | 500.964000 |
| 1078 | 0.000000 | 1078 | 410.240000 |
| 1079 | 0.000000 | 1079 | 108.644000 |
| 1080 | 0.000000 | 1080 | 201.820000 |
| 1081 | 0.000000 | 1081 | 326.872000 |
| 1082 | 1.475892 | 1082 | 0.000000 |
| 1083 | 0.000000 | 1083 | 623.564000 |
| 1084 | 0.000000 | 1084 | 223.888000 |
| 1085 | 0.000000 | 1085 | 76.768000 |
| 1086 | 0.000000 | 1086 | 221.436000 |
| 1087 | 0.000000 | 1087 | 997.494000 |
| 1088 | -0.000000 | 1088 | 0.000000 |
| 1089 | 0.000000 | 1089 | 363.652000 |
| 1090 | 0.000000 | 1090 | 171.170000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|-------------|
| 1091 | 0.000000 | 1091 | 51.022000 |
| 1092 | 0.000000 | 1092 | 584.332000 |
| 1093 | 0.000000 | 1093 | 1482.990000 |
| 1094 | 0.000000 | 1094 | 863.860000 |
| 1095 | 0.000000 | 1095 | 856.504000 |
| 1096 | 0.000000 | 1096 | 811.142000 |
| 1097 | 0.000000 | 1097 | 259.442000 |
| 1098 | 0.000000 | 1098 | 352.618000 |
| 1099 | 0.000000 | 1099 | 1149.518000 |
| 1100 | 0.000000 | 1100 | 564.716000 |
| 1101 | 5.303982 | 1101 | 0.000000 |
| 1102 | 0.000000 | 1102 | 561.038000 |
| 1103 | 0.000000 | 1103 | 397.224000 |
| 1104 | 0.000000 | 1104 | 171.170000 |
| 1105 | 0.000000 | 1105 | 346.488000 |
| 1106 | 0.000000 | 1106 | 1109.060000 |
| 1107 | 0.000000 | 1107 | 558.586000 |
| 1108 | 0.553459 | 1108 | 0.000000 |
| 1109 | 0.000000 | 1109 | 505.868000 |
| 1110 | 0.000000 | 1110 | 494.834000 |
| 1111 | 0.000000 | 1111 | 313.856000 |
| 1112 | 0.000000 | 1112 | 104.966000 |
| 1113 | 0.000000 | 1113 | 142.972000 |
| 1114 | 0.000000 | 1114 | 970.522000 |
| 1115 | 0.000000 | 1115 | 464.184000 |
| 1116 | 1.614260 | 1116 | 0.000000 |
| 1117 | 0.000000 | 1117 | 492.382000 |
| 1118 | 0.000000 | 1118 | 410.240000 |
| 1119 | 0.000000 | 1119 | 367.800000 |
| 1120 | 0.000000 | 1120 | 124.582000 |
| 1121 | 0.000000 | 1121 | 149.102000 |
| 1122 | 0.000000 | 1122 | 1024.466000 |
| 1123 | 0.000000 | 1123 | 435.986000 |
| 1124 | 0.415094 | 1124 | 0.000000 |
| 1125 | 0.000000 | 1125 | 385.720000 |
| 1126 | 0.000000 | 1126 | 411.466000 |
| 1127 | 0.000000 | 1127 | 114.774000 |
| 1128 | 0.000000 | 1128 | 230.018000 |
| 1129 | 0.000000 | 1129 | 1025.692000 |
| 1130 | 0.000000 | 1130 | 461.732000 |
| 1131 | 0.830189 | 1131 | 0.000000 |
| 1132 | 0.000000 | 1132 | 448.246000 |
| 1133 | 0.000000 | 1133 | 267.268000 |
| 1134 | 0.000000 | 1134 | 116.000000 |
| 1135 | 0.000000 | 1135 | 233.696000 |
| 1136 | 0.000000 | 1136 | 619.886000 |
| 1137 | 0.000000 | 1137 | 420.048000 |
| 1138 | 0.461216 | 1138 | 0.000000 |
| 1139 | 0.000000 | 1139 | 497.286000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|-------------|
| 1140 | 0.000000 | 1140 | 346.488000 |
| 1141 | 0.000000 | 1141 | 122.130000 |
| 1142 | 0.000000 | 1142 | 330.550000 |
| 1143 | 0.000000 | 1143 | 1302.768000 |
| 1144 | 0.000000 | 1144 | 699.576000 |
| 1145 | 0.599581 | 1145 | 0.000000 |
| 1146 | 0.000000 | 1146 | 713.062000 |
| 1147 | 0.000000 | 1147 | 580.654000 |
| 1148 | 0.000000 | 1148 | 142.972000 |
| 1149 | 0.000000 | 1149 | 233.696000 |
| 1150 | 0.000000 | 1150 | 1036.726000 |
| 1151 | 0.000000 | 1151 | 499.738000 |
| 1152 | 1.014680 | 1152 | 0.000000 |
| 1153 | 0.000000 | 1153 | 547.552000 |
| 1154 | 0.000000 | 1154 | 443.342000 |
| 1155 | 0.000000 | 1155 | 122.130000 |
| 1156 | 0.000000 | 1156 | 301.126000 |
| 1157 | 0.000000 | 1157 | 1127.450000 |
| 1158 | 0.000000 | 1158 | 562.264000 |
| 1159 | 1.060800 | 1159 | 0.000000 |
| 1160 | 0.000000 | 1160 | 652.988000 |
| 1161 | 0.000000 | 1161 | 497.286000 |
| 1162 | 0.000000 | 1162 | 98.836000 |
| 1163 | 0.000000 | 1163 | 158.910000 |
| 1164 | 0.000000 | 1164 | 477.670000 |
| 1165 | 0.000000 | 1165 | 269.250000 |
| 1166 | 0.876310 | 1166 | 0.000000 |
| 1167 | 0.000000 | 1167 | 369.782000 |
| 1168 | 0.000000 | 1168 | 157.684000 |
| 1169 | 0.000000 | 1169 | 62.056000 |
| 1170 | 0.000000 | 1170 | 212.854000 |
| 1171 | 0.000000 | 1171 | 857.730000 |
| 1172 | 0.000000 | 1172 | 492.382000 |
| 1173 | 0.830189 | 1173 | 0.000000 |
| 1174 | 0.000000 | 1174 | 504.642000 |
| 1175 | 0.000000 | 1175 | 319.516000 |
| 1176 | 0.000000 | 1176 | 87.802000 |
| 1177 | 0.000000 | 1177 | 334.698000 |
| 1178 | 0.138365 | 1178 | 0.000000 |
| 1179 | 0.000000 | 1179 | 396.754000 |
| 1180 | 0.000000 | 1180 | 1120.094000 |
| 1181 | 0.000000 | 1181 | 708.158000 |
| 1182 | 0.368973 | 1182 | 0.000000 |
| 1183 | 0.000000 | 1183 | 775.588000 |
| 1184 | 0.000000 | 1184 | 753.520000 |
| 1185 | 0.000000 | 1185 | 125.808000 |
| 1186 | 0.000000 | 1186 | 480.122000 |
| 1187 | 0.000000 | 1187 | 1513.640000 |
| 1188 | 0.000000 | 1188 | 759.650000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|-------------|
| 1189 | 1.522010 | 1189 | 0.000000 |
| 1190 | 0.000000 | 1190 | 525.484000 |
| 1191 | 0.000000 | 1191 | 738.808000 |
| 1192 | 0.000000 | 1192 | 114.774000 |
| 1193 | 0.461216 | 1193 | 0.000000 |
| 1194 | 0.000000 | 1194 | 472.766000 |
| 1195 | 0.000000 | 1195 | 925.160000 |
| 1196 | 0.000000 | 1196 | 720.418000 |
| 1197 | 0.645702 | 1197 | 0.000000 |
| 1198 | 0.000000 | 1198 | 747.390000 |
| 1199 | 0.000000 | 1199 | 188.334000 |
| 1200 | 0.000000 | 1200 | 400.432000 |
| 1201 | 0.000000 | 1201 | 1300.316000 |
| 1202 | 0.000000 | 1202 | 657.892000 |
| 1203 | 0.784067 | 1203 | 0.000000 |
| 1204 | 0.000000 | 1204 | 410.240000 |
| 1205 | 0.000000 | 1205 | 616.208000 |
| 1206 | 0.000000 | 1206 | 84.124000 |
| 1207 | 0.000000 | 1207 | 453.150000 |
| 1208 | 0.000000 | 1208 | 1324.836000 |
| 1209 | 0.000000 | 1209 | 713.062000 |
| 1210 | 1.060800 | 1210 | 0.000000 |
| 1211 | 0.000000 | 1211 | 464.184000 |
| 1212 | 0.000000 | 1212 | 154.006000 |
| 1213 | 0.046122 | 1213 | 0.000000 |
| 1214 | 0.184486 | 1214 | 0.000000 |
| 1215 | 0.000000 | 1215 | 247.182000 |
| 1216 | 0.000000 | 1216 | 803.786000 |
| 1217 | 0.000000 | 1217 | 509.546000 |
| 1218 | 0.368973 | 1218 | 0.000000 |
| 1219 | 0.000000 | 1219 | 518.128000 |
| 1220 | 0.000000 | 1220 | 428.630000 |
| 1221 | 0.000000 | 1221 | 86.576000 |
| 1222 | 0.000000 | 1222 | 78.464000 |
| 1223 | 0.461216 | 1223 | 0.000000 |
| 1224 | 0.000000 | 1224 | 400.432000 |
| 1225 | 0.000000 | 1225 | 1191.202000 |
| 1226 | 0.000000 | 1226 | 617.434000 |
| 1227 | 0.691824 | 1227 | 0.000000 |
| 1228 | 0.000000 | 1228 | 748.616000 |
| 1229 | 0.000000 | 1229 | 586.784000 |
| 1230 | 0.000000 | 1230 | 120.904000 |
| 1231 | 0.000000 | 1231 | 569.620000 |
| 1232 | 0.000000 | 1232 | 1028.144000 |
| 1233 | 0.000000 | 1233 | 834.436000 |
| 1234 | 3.413000 | 1234 | 0.000000 |
| 1235 | 0.000000 | 1235 | 639.502000 |
| 1236 | 0.000000 | 1236 | 283.962000 |
| 1237 | 0.184486 | 1237 | 0.000000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|-------------|
| 1238 | 0.276730 | 1238 | 0.000000 |
| 1239 | 0.322851 | 1239 | 0.000000 |
| 1240 | 0.553459 | 1240 | 0.000000 |
| 1241 | 0.092243 | 1241 | 0.000000 |
| 1242 | 0.092243 | 1242 | 0.000000 |
| 1243 | 0.000000 | 1243 | 111.096000 |
| 1244 | 0.000000 | 1244 | 912.900000 |
| 1245 | 0.000000 | 1245 | 386.946000 |
| 1246 | 0.922432 | 1246 | 0.000000 |
| 1247 | 0.000000 | 1247 | 315.838000 |
| 1248 | 0.000000 | 1248 | 375.912000 |
| 1249 | 0.000000 | 1249 | 124.582000 |
| 1250 | 0.000000 | 1250 | 160.136000 |
| 1251 | 0.000000 | 1251 | 787.848000 |
| 1252 | 0.000000 | 1252 | 304.804000 |
| 1253 | 1.983230 | 1253 | 0.000000 |
| 1254 | 0.000000 | 1254 | 428.630000 |
| 1255 | 0.000000 | 1255 | 180.978000 |
| 1256 | 0.000000 | 1256 | 224.358000 |
| 1257 | 0.000000 | 1257 | 101.288000 |
| 1258 | 0.000000 | 1258 | 225.114000 |
| 1259 | 0.000000 | 1259 | 976.652000 |
| 1260 | 0.000000 | 1260 | 456.828000 |
| 1261 | 1.060800 | 1261 | 0.000000 |
| 1262 | 0.000000 | 1262 | 686.090000 |
| 1263 | 0.000000 | 1263 | 455.602000 |
| 1264 | 0.000000 | 1264 | 89.028000 |
| 1265 | 0.092243 | 1265 | 0.000000 |
| 1266 | 0.000000 | 1266 | 98.080000 |
| 1267 | 0.000000 | 1267 | 214.080000 |
| 1268 | 0.000000 | 1268 | 836.888000 |
| 1269 | 0.000000 | 1269 | 352.618000 |
| 1270 | 0.322851 | 1270 | 0.000000 |
| 1271 | 0.000000 | 1271 | 519.354000 |
| 1272 | 0.000000 | 1272 | 236.148000 |
| 1273 | 0.000000 | 1273 | 157.684000 |
| 1274 | 0.000000 | 1274 | 242.278000 |
| 1275 | 0.000000 | 1275 | 1134.806000 |
| 1276 | 0.000000 | 1276 | 523.032000 |
| 1277 | 1.153040 | 1277 | 0.000000 |
| 1278 | 0.000000 | 1278 | 668.926000 |
| 1279 | 0.000000 | 1279 | 469.088000 |
| 1280 | 0.000000 | 1280 | 135.616000 |
| 1281 | 0.000000 | 1281 | 203.046000 |
| 1282 | 0.000000 | 1282 | 987.686000 |
| 1283 | 0.000000 | 1283 | 233.696000 |
| 1284 | 0.276730 | 1284 | 0.000000 |
| 1285 | 0.000000 | 1285 | 418.822000 |
| 1286 | 0.000000 | 1286 | 270.476000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|----------|--------------|-------------|
| 1287 | 0.000000 | 1287 | 269.720000 |
| 1288 | 0.000000 | 1288 | 157.684000 |
| 1289 | 0.184486 | 1289 | 0.000000 |
| 1290 | 0.000000 | 1290 | 223.888000 |
| 1291 | 0.000000 | 1291 | 1042.856000 |
| 1292 | 0.000000 | 1292 | 405.336000 |
| 1293 | 0.968554 | 1293 | 0.000000 |
| 1294 | 0.000000 | 1294 | 394.302000 |
| 1295 | 0.000000 | 1295 | 386.946000 |
| 1296 | 0.000000 | 1296 | 220.680000 |
| 1297 | 0.000000 | 1297 | 204.272000 |
| 1298 | 0.000000 | 1298 | 123.356000 |
| 1299 | 0.000000 | 1299 | 652.988000 |
| 1300 | 0.000000 | 1300 | 288.866000 |
| 1301 | 0.092243 | 1301 | 0.000000 |
| 1302 | 0.000000 | 1302 | 444.568000 |
| 1303 | 0.000000 | 1303 | 277.832000 |
| 1304 | 0.000000 | 1304 | 189.560000 |
| 1305 | 0.046122 | 1305 | 0.000000 |
| 1306 | 0.000000 | 1306 | 205.498000 |
| 1307 | 0.000000 | 1307 | 999.946000 |
| 1308 | 0.000000 | 1308 | 451.924000 |
| 1309 | 0.276730 | 1309 | 0.000000 |
| 1310 | 0.000000 | 1310 | 486.252000 |
| 1311 | 0.000000 | 1311 | 369.782000 |
| 1312 | 0.000000 | 1312 | 145.424000 |
| 1313 | 0.000000 | 1313 | 122.600000 |
| 1314 | 0.276730 | 1314 | 0.000000 |
| 1315 | 0.507338 | 1315 | 0.000000 |
| 1316 | 0.000000 | 1316 | 161.832000 |
| 1317 | 0.461216 | 1317 | 0.000000 |
| 1318 | 0.000000 | 1318 | 113.548000 |
| 1319 | 0.000000 | 1319 | 839.340000 |
| 1320 | 0.000000 | 1320 | 271.702000 |
| 1321 | 0.276729 | 1321 | 0.000000 |
| 1322 | 0.000000 | 1322 | 432.308000 |
| 1323 | 0.000000 | 1323 | 103.740000 |
| 1324 | 0.000000 | 1324 | 120.148000 |
| 1325 | 1.660380 | 1325 | 0.000000 |
| 1326 | 0.276730 | 1326 | 0.000000 |
| 1327 | 0.000000 | 1327 | 351.392000 |
| 1328 | 0.000000 | 1328 | 1093.122000 |
| 1329 | 0.000000 | 1329 | 550.004000 |
| 1330 | 0.830189 | 1330 | 0.000000 |
| 1331 | 0.000000 | 1331 | 293.770000 |
| 1332 | 0.000000 | 1332 | 505.868000 |
| 1333 | 0.000000 | 1333 | 107.888000 |
| 1334 | 0.000000 | 1334 | 188.334000 |
| 1335 | 0.000000 | 1335 | 217.002000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 1336 | 1.291400 | 1336 | 0.000000 |
| 1337 | 0.000000 | 1337 | 19.616000 |
| 1338 | 0.415094 | 1338 | 0.000000 |
| 1339 | 0.000000 | 1339 | 310.934000 |
| 1340 | 0.000000 | 1340 | 1084.540000 |
| 1341 | 0.000000 | 1341 | 486.252000 |
| 1342 | 2.951780 | 1342 | 0.000000 |
| 1343 | 0.000000 | 1343 | 70.638000 |
| 1344 | 0.000000 | 1344 | 489.930000 |
| 1345 | -0.000000 | 1345 | 0.000000 |
| 1346 | 0.000000 | 1346 | 79.220000 |
| 1347 | 0.230608 | 1347 | 0.000000 |
| 1348 | 0.000000 | 1348 | 36.780000 |
| 1349 | 0.000000 | 1349 | 308.482000 |
| 1350 | 0.000000 | 1350 | 1158.100000 |
| 1351 | 0.000000 | 1351 | 530.388000 |
| 1352 | 2.675050 | 1352 | 0.000000 |
| 1353 | 0.000000 | 1353 | 248.408000 |
| 1354 | 0.000000 | 1354 | 524.258000 |
| 1355 | 0.000000 | 1355 | 62.526000 |
| 1356 | 0.000000 | 1356 | 172.396000 |
| 1357 | 0.000000 | 1357 | 45.362000 |
| 1358 | 0.737946 | 1358 | 0.000000 |
| 1359 | 0.000000 | 1359 | 393.832000 |
| 1360 | 0.000000 | 1360 | 1290.038000 |
| 1361 | 0.000000 | 1361 | 618.190000 |
| 1362 | 0.000000 | 1362 | 190.786000 |
| 1363 | 0.000000 | 1363 | 315.368000 |
| 1364 | 0.000000 | 1364 | 678.264000 |
| 1365 | 0.000000 | 1365 | 273.684000 |
| 1366 | 0.276730 | 1366 | 0.000000 |
| 1367 | 0.230608 | 1367 | 0.000000 |
| 1368 | 0.000000 | 1368 | 331.776000 |
| 1369 | 0.000000 | 1369 | 590.462000 |
| 1370 | 0.000000 | 1370 | 610.078000 |
| 1371 | 0.276730 | 1371 | 0.000000 |
| 1372 | 0.000000 | 1372 | 645.632000 |
| 1373 | 0.000000 | 1373 | 189.560000 |
| 1374 | 0.046122 | 1374 | 0.000000 |
| 1375 | 0.046122 | 1375 | 0.000000 |
| 1376 | 0.000000 | 1376 | 271.702000 |
| 1377 | 0.000000 | 1377 | 569.620000 |
| 1378 | 0.599581 | 1378 | 0.000000 |
| 1379 | 0.000000 | 1379 | 538.970000 |
| 1380 | 0.000000 | 1380 | 351.392000 |
| 1381 | 0.000000 | 1381 | 561.508000 |
| 1382 | 0.000000 | 1382 | 203.046000 |
| 1383 | 0.138365 | 1383 | 0.000000 |
| 1384 | 0.000000 | 1384 | 288.866000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|-------------|
| 1385 | 0.000000 | 1385 | 753.520000 |
| 1386 | 0.000000 | 1386 | 420.048000 |
| 1387 | 0.138365 | 1387 | 0.000000 |
| 1388 | 0.000000 | 1388 | 596.592000 |
| 1389 | 0.000000 | 1389 | 324.420000 |
| 1390 | 0.000000 | 1390 | 245.956000 |
| 1391 | 0.138365 | 1391 | 0.000000 |
| 1392 | 0.046122 | 1392 | 0.000000 |
| 1393 | 0.046122 | 1393 | 0.000000 |
| 1394 | 0.000000 | 1394 | 412.692000 |
| 1395 | 0.000000 | 1395 | 708.158000 |
| 1396 | 0.000000 | 1396 | 639.502000 |
| 1397 | 1.014680 | 1397 | 0.000000 |
| 1398 | 0.000000 | 1398 | 660.344000 |
| 1399 | 0.000000 | 1399 | 89.028000 |
| 1400 | 0.000000 | 1400 | 464.184000 |
| 1401 | 0.000000 | 1401 | 568.394000 |
| 1402 | 0.000000 | 1402 | 686.090000 |
| 1403 | 0.461216 | 1403 | 0.000000 |
| 1404 | 0.000000 | 1404 | 703.250000 |
| 1405 | 0.000000 | 1405 | 287.640000 |
| 1406 | 0.046122 | 1406 | 0.000000 |
| 1407 | 0.092243 | 1407 | 0.000000 |
| 1408 | 0.000000 | 1408 | 218.984000 |
| 1409 | 0.000000 | 1409 | 404.110000 |
| 1410 | 0.000000 | 1410 | 503.416000 |
| 1411 | 0.138365 | 1411 | 0.000000 |
| 1412 | 0.000000 | 1412 | 1006.074000 |
| 1413 | 0.000000 | 1413 | 282.736000 |
| 1414 | 0.000000 | 1414 | 515.676000 |
| 1415 | 0.000000 | 1415 | 1431.498000 |
| 1416 | 0.000000 | 1416 | 827.080000 |
| 1417 | 0.138365 | 1417 | 0.000000 |
| 1418 | 0.000000 | 1418 | 818.498000 |
| 1419 | 0.000000 | 1419 | 742.486000 |
| 1420 | 0.000000 | 1420 | 290.092000 |
| 1421 | 0.000000 | 1421 | 648.084000 |
| 1422 | 0.000000 | 1422 | 558.586000 |
| 1423 | 0.230608 | 1423 | 0.000000 |
| 1424 | 0.000000 | 1424 | 612.530000 |
| 1425 | 0.000000 | 1425 | 431.082000 |
| 1426 | 0.000000 | 1426 | 210.402000 |
| 1427 | -0.000000 | 1427 | 0.000000 |
| 1428 | 0.000000 | 1428 | 116.000000 |
| 1429 | 0.432363 | 1429 | 0.000000 |
| 1430 | 1.337527 | 1430 | 0.000000 |
| 1431 | -0.000000 | 1431 | 0.000000 |
| 1432 | 0.000000 | 1432 | 116.000000 |
| 1433 | 2.738293 | 1433 | 0.000000 |

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| Coordenada x | Valor x | Coordenada z | Valor z |
|--------------|-----------|--------------|------------|
| 1434 | 1.383649 | 1434 | 0.000000 |
| 1435 | -0.000000 | 1435 | 0.000000 |
| 1436 | -0.000000 | 1436 | 0.000000 |
| 1437 | -0.000000 | 1437 | 0.000000 |
| 1438 | -0.000000 | 1438 | 0.000000 |
| 1439 | 0.000000 | 1439 | 116.000000 |
| 1440 | -0.000000 | 1440 | 0.000000 |
| 1441 | 0.000000 | 1441 | 58.000000 |
| 1442 | 0.000000 | 1442 | 116.000000 |
| 1443 | -0.000000 | 1443 | 0.000000 |
| 1444 | -0.000000 | 1444 | 0.000000 |
| 1445 | 0.144121 | 1445 | 0.000000 |
| 1446 | 5.303982 | 1446 | 0.000000 |
| 1447 | 4.293150 | 1447 | 0.000000 |
| 1448 | 0.249790 | 1448 | 0.000000 |
| 1449 | 0.115296 | 1449 | 0.000000 |
| 1450 | 0.276729 | 1450 | 0.000000 |
| 1451 | -0.000000 | 1451 | 0.000000 |
| 1452 | -0.000000 | 1452 | 0.000000 |
| 1453 | -0.000000 | 1453 | 0.000000 |
| 1454 | -0.000000 | 1454 | 0.000000 |
| 1455 | -0.000000 | 1455 | 0.000000 |
| 1456 | -0.000000 | 1456 | 0.000000 |
| 1457 | 0.144121 | 1457 | 0.000000 |
| 1458 | 0.138365 | 1458 | 0.000000 |

3 Variáveis Duais (Multiplicadores de Lagrange)

Tabela 2: Variáveis duais do problema SHIP04S

| Coordenada y | Valor y |
|--------------|--------------|
| 1 | -0.000000 |
| 2 | -4707.225331 |
| 3 | -0.000000 |
| 4 | -0.000000 |
| 5 | -0.000000 |
| 6 | -0.000000 |
| 7 | -0.000000 |
| 8 | -0.000000 |
| 9 | -0.000000 |
| 10 | -0.000000 |
| 11 | -0.000000 |
| 12 | -0.000000 |
| 13 | -3425.814581 |
| 14 | -0.000000 |
| 15 | -0.000000 |

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| Coordenada y | Valor y |
|--------------|-------------|
| 16 | -0.000000 |
| 17 | -0.000000 |
| 18 | -0.000000 |
| 19 | -0.000000 |
| 20 | -0.000000 |
| 21 | -0.000000 |
| 22 | -0.000000 |
| 23 | -0.000000 |
| 24 | -0.000000 |
| 25 | -0.000000 |
| 26 | -0.000000 |
| 27 | -116.000000 |
| 28 | -116.000000 |
| 29 | -116.000000 |
| 30 | -0.000000 |
| 31 | -116.000000 |
| 32 | -116.000000 |
| 33 | -116.000000 |
| 34 | -116.000000 |
| 35 | -0.000000 |
| 36 | -0.000000 |
| 37 | -116.000000 |
| 38 | -116.000000 |
| 39 | -116.000000 |
| 40 | -116.000000 |
| 41 | -116.000000 |
| 42 | -116.000000 |
| 43 | -58.000000 |
| 44 | -58.000000 |
| 45 | -58.000000 |
| 46 | -0.000000 |
| 47 | -58.000000 |
| 48 | -58.000000 |
| 49 | -58.000000 |
| 50 | -58.000000 |
| 51 | -116.000000 |
| 52 | -116.000000 |
| 53 | -116.000000 |
| 54 | -0.000000 |
| 55 | -116.000000 |
| 56 | -116.000000 |
| 57 | -116.000000 |
| 58 | -116.000000 |
| 59 | 4499.947592 |
| 60 | 4687.525592 |
| 61 | 4916.317592 |
| 62 | 4645.371592 |
| 63 | 4946.967592 |
| 64 | 4859.921592 |

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| Coordenada y | Valor y |
|--------------|-------------|
| 65 | 4641.693592 |
| 66 | 4696.863592 |
| 67 | 4785.135592 |
| 68 | 4918.769592 |
| 69 | 4745.903592 |
| 70 | 4723.835592 |
| 71 | -0.000000 |
| 72 | 4790.039592 |
| 73 | 4987.425592 |
| 74 | 4809.655592 |
| 75 | 4801.073592 |
| 76 | 4830.497592 |
| 77 | 4840.305592 |
| 78 | 4783.909592 |
| 79 | 5037.691592 |
| 80 | 4919.995592 |
| 81 | 4850.113592 |
| 82 | -0.000000 |
| 83 | 5327.027592 |
| 84 | 4976.391592 |
| 85 | 4902.831592 |
| 86 | 4913.865592 |
| 87 | 4889.345592 |
| 88 | 5018.075592 |
| 89 | 4752.033592 |
| 90 | 4837.853592 |
| 91 | 5293.925592 |
| 92 | 4904.057592 |
| 93 | 4794.943592 |
| 94 | 5004.119592 |
| 95 | 4728.739592 |
| 96 | 4782.683592 |
| 97 | 4775.327592 |
| 98 | 4818.237592 |
| 99 | 4856.243592 |
| 100 | 4726.287592 |
| 101 | 4810.881592 |
| 102 | 4978.373592 |
| 103 | 4826.819592 |
| 104 | 4916.317592 |
| 105 | 4750.807592 |
| 106 | 4732.417592 |
| 107 | 5019.301592 |
| 108 | 4911.413592 |
| 109 | 5022.979592 |
| 110 | 4753.259592 |
| 111 | 5056.081592 |
| 112 | 4842.757592 |
| 113 | 4956.775592 |

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| Coordenada y | Valor y |
|--------------|-------------|
| 114 | 5094.087592 |
| 115 | 4935.933592 |
| 116 | 4976.391592 |
| 117 | 4868.503592 |
| 118 | 4935.933592 |
| 119 | -0.000000 |
| 120 | -0.000000 |
| 121 | 4942.063592 |
| 122 | 4859.921592 |
| 123 | 5179.907592 |
| 124 | 5121.059592 |
| 125 | 5087.957592 |
| 126 | 5293.925592 |
| 127 | 5074.471592 |
| 128 | -0.000000 |
| 129 | 5155.387592 |
| 130 | 5469.243592 |
| 131 | 5094.087592 |
| 132 | 5060.985592 |
| 133 | 5482.729592 |
| 134 | 5295.151592 |
| 135 | 5136.997592 |
| 136 | 5345.417592 |
| 137 | 5133.319592 |
| 138 | 5103.895592 |
| 139 | -0.000000 |
| 140 | 5206.879592 |
| 141 | 4717.705592 |
| 142 | 4988.651592 |
| 143 | -0.000000 |
| 144 | -0.000000 |
| 145 | 4617.947592 |
| 146 | 4902.525592 |
| 147 | 4918.317592 |
| 148 | 4831.271592 |
| 149 | 4948.967592 |
| 150 | 4861.921592 |
| 151 | 4643.693592 |
| 152 | 4698.863592 |
| 153 | 4787.135592 |
| 154 | 4920.769592 |
| 155 | 4747.903592 |
| 156 | 4725.835592 |
| 157 | -0.000000 |
| 158 | 4792.039592 |
| 159 | 4989.425592 |
| 160 | 4811.655592 |
| 161 | 4803.073592 |
| 162 | 4832.497592 |

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| Coordenada y | Valor y |
|--------------|-------------|
| 163 | 4921.995592 |
| 164 | -0.000000 |
| 165 | 5112.025592 |
| 166 | -0.000000 |
| 167 | 4904.831592 |
| 168 | -0.000000 |
| 169 | -0.000000 |
| 170 | -0.000000 |
| 171 | 4904.831592 |
| 172 | 4915.865592 |
| 173 | 4891.345592 |
| 174 | -0.000000 |
| 175 | 4754.033592 |
| 176 | -0.000000 |
| 177 | 5392.925592 |
| 178 | -0.000000 |
| 179 | -0.000000 |
| 180 | 5006.119592 |
| 181 | 4730.739592 |
| 182 | -0.000000 |
| 183 | 4777.327592 |
| 184 | 4820.237592 |
| 185 | 4858.243592 |
| 186 | 4728.287592 |
| 187 | 4812.881592 |
| 188 | 4980.373592 |
| 189 | 4828.819592 |
| 190 | 4918.317592 |
| 191 | 4752.807592 |
| 192 | 4734.417592 |
| 193 | 5021.301592 |
| 194 | -0.000000 |
| 195 | 5024.979592 |
| 196 | 4755.259592 |
| 197 | 5058.081592 |
| 198 | 4844.757592 |
| 199 | 4958.775592 |
| 200 | 5096.087592 |
| 201 | 4937.933592 |
| 202 | -0.000000 |
| 203 | 4870.503592 |
| 204 | -0.000000 |
| 205 | -0.000000 |
| 206 | -0.000000 |
| 207 | 4944.063592 |
| 208 | 4711.593592 |
| 209 | 5278.907592 |
| 210 | 5220.059592 |
| 211 | 5138.997592 |

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| Coordenada y | Valor y |
|--------------|-------------|
| 212 | 5392.925592 |
| 213 | 5173.471592 |
| 214 | -0.000000 |
| 215 | 5157.387592 |
| 216 | 5568.243592 |
| 217 | 5096.087592 |
| 218 | 5159.985592 |
| 219 | 5581.729592 |
| 220 | 5394.151592 |
| 221 | 5151.257592 |
| 222 | 5444.417592 |
| 223 | 5232.319592 |
| 224 | -0.000000 |
| 225 | -0.000000 |
| 226 | 5305.879592 |
| 227 | 4834.949592 |
| 228 | 4990.651592 |
| 229 | -0.000000 |
| 230 | -0.000000 |
| 231 | 2813.659265 |
| 232 | 3066.563265 |
| 233 | 2913.193265 |
| 234 | 2683.451265 |
| 235 | 2861.861265 |
| 236 | 2820.545265 |
| 237 | 2813.033265 |
| 238 | 2838.073265 |
| 239 | 2841.829265 |
| 240 | 2908.185265 |
| 241 | 2770.465265 |
| 242 | 2808.651265 |
| 243 | -0.000000 |
| 244 | 2808.025265 |
| 245 | 2981.427265 |
| 246 | 2863.113265 |
| 247 | 2795.287265 |
| 248 | 2779.855265 |
| 249 | 2782.985265 |
| 250 | 2754.189265 |
| 251 | 2883.771265 |
| 252 | 2823.675265 |
| 253 | 2787.993265 |
| 254 | -0.000000 |
| 255 | 3391.865265 |
| 256 | -0.000000 |
| 257 | 2893.161265 |
| 258 | 2983.713265 |
| 259 | 2808.025265 |
| 260 | -0.000000 |

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| Coordenada y | Valor y |
|--------------|-------------|
| 261 | 2941.145265 |
| 262 | 2781.733265 |
| 263 | 3374.963265 |
| 264 | 2815.537265 |
| 265 | -0.000000 |
| 266 | 3011.883265 |
| 267 | 2873.755265 |
| 268 | 2876.259265 |
| 269 | 2839.325265 |
| 270 | 2974.949265 |
| 271 | 2886.275265 |
| 272 | 2805.521265 |
| 273 | 2868.747265 |
| 274 | 2998.737265 |
| 275 | 2866.243265 |
| 276 | 2963.273265 |
| 277 | 2940.519265 |
| 278 | 2827.431265 |
| 279 | 3015.013265 |
| 280 | -0.000000 |
| 281 | 2996.859265 |
| 282 | 2885.023265 |
| 283 | 3035.045265 |
| 284 | -0.000000 |
| 285 | 2867.495265 |
| 286 | 3004.997265 |
| 287 | 3025.029265 |
| 288 | 2898.169265 |
| 289 | 3000.615265 |
| 290 | -0.000000 |
| 291 | -0.000000 |
| 292 | -0.000000 |
| 293 | 3015.013265 |
| 294 | 2797.601265 |
| 295 | 3316.745265 |
| 296 | 3286.697265 |
| 297 | 2969.533265 |
| 298 | 3374.963265 |
| 299 | 3262.909265 |
| 300 | -0.000000 |
| 301 | 3009.597265 |
| 302 | 3464.481265 |
| 303 | 2969.533265 |
| 304 | 3256.023265 |
| 305 | -0.000000 |
| 306 | 3375.589265 |
| 307 | 2934.477265 |
| 308 | 3112.261265 |
| 309 | 3292.957265 |

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| Coordenada y | Valor y |
|--------------|-------------|
| 310 | -0.000000 |
| 311 | -0.000000 |
| 312 | 3125.407265 |
| 313 | 2720.385265 |
| 314 | 2915.071265 |
| 315 | -0.000000 |
| 316 | -0.000000 |
| 317 | 4991.379592 |
| 318 | 5486.683592 |
| 319 | 5186.313592 |
| 320 | 4736.371592 |
| 321 | 5085.781592 |
| 322 | 5004.865592 |
| 323 | 4990.153592 |
| 324 | 5039.193592 |
| 325 | 5046.549592 |
| 326 | 5176.505592 |
| 327 | 4906.785592 |
| 328 | 4981.571592 |
| 329 | -0.000000 |
| 330 | 4980.345592 |
| 331 | 5319.947592 |
| 332 | 5088.233592 |
| 333 | 4957.807592 |
| 334 | 4925.175592 |
| 335 | 4931.305592 |
| 336 | 4874.909592 |
| 337 | 5128.691592 |
| 338 | 5010.995592 |
| 339 | 4941.113592 |
| 340 | -0.000000 |
| 341 | 6126.185592 |
| 342 | 5067.391592 |
| 343 | 5147.081592 |
| 344 | 5326.833592 |
| 345 | 4980.345592 |
| 346 | 5109.075592 |
| 347 | 5243.465592 |
| 348 | 4928.853592 |
| 349 | 6093.083592 |
| 350 | 4995.057592 |
| 351 | 4885.943592 |
| 352 | 5382.003592 |
| 353 | 5109.075592 |
| 354 | 5113.979592 |
| 355 | 5041.645592 |
| 356 | 5309.669592 |
| 357 | 5133.595592 |
| 358 | 4975.441592 |

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| Coordenada y | Valor y |
|--------------|-------------|
| 359 | 5099.267592 |
| 360 | 5356.257592 |
| 361 | 5094.363592 |
| 362 | 5284.393592 |
| 363 | 5242.239592 |
| 364 | 5018.351592 |
| 365 | 5388.133592 |
| 366 | 5402.845592 |
| 367 | 5352.579592 |
| 368 | 5131.143592 |
| 369 | 5427.365592 |
| 370 | 5334.189592 |
| 371 | 5096.815592 |
| 372 | 5368.517592 |
| 373 | 5407.749592 |
| 374 | 5156.889592 |
| 375 | 5359.935592 |
| 376 | 5118.883592 |
| 377 | -0.000000 |
| 378 | -0.000000 |
| 379 | 5388.133592 |
| 380 | 4957.521592 |
| 381 | 5979.065592 |
| 382 | 5920.217592 |
| 383 | 5296.653592 |
| 384 | 6093.083592 |
| 385 | 5873.629592 |
| 386 | -0.000000 |
| 387 | 5375.117592 |
| 388 | 6268.401592 |
| 389 | 5296.653592 |
| 390 | 5860.143592 |
| 391 | 6281.887592 |
| 392 | 6094.309592 |
| 393 | 5227.997592 |
| 394 | 5576.181592 |
| 395 | 5932.477592 |
| 396 | 5194.895592 |
| 397 | -0.000000 |
| 398 | 5601.927592 |
| 399 | 4808.705592 |
| 400 | 5189.991592 |
| 401 | -0.000000 |
| 402 | -0.000000 |

4 Observações

- O solver HiGHS foi configurado com o método IPM (Interior Point Method).
- Este arquivo contém a solução detalhada para o problema SHIP04S.

- As variáveis duais representam os multiplicadores de Lagrange das restrições.
- Os custos reduzidos (\bar{z}) indicam o impacto de forçar variáveis não-básicas na base.