

Solução do Problema SHIP04S - Solver HiGHS

Análise Computacional

17 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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continua na próxima página

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

Continúa na próxima página

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.