Rank-65634 over GF(16)

January 15, 2021

The equation

The equation of the surface is :

$$X_0^3 + X_1^3 + X_2^3 + X_3^3 + X_0^2X_1 + X_0^2X_3 + X_0X_1X_2 = 0$$

(1, 1, 1, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(16) is 303178278

General information

Number of lines	2
Number of points	289
Number of singular points	0
Number of Eckardt points	0
Number of double points	0
Number of single points	34
Number of points off lines	255
Number of Hesse planes	0
Number of axes	0
Type of points on lines	17^2
Type of lines on points	1^{34}, 0^{255}

Singular Points

The surface has 0 singular points:

The 2 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \left[\begin{array}{cccc} 1 & 0 & \delta^5 & 0 \\ 0 & 1 & 0 & \delta^{10} \end{array}\right]_{3163} = \left[\begin{array}{cccc} 1 & 0 & 11 & 0 \\ 0 & 1 & 0 & 10 \end{array}\right]_{3163} = \mathbf{Pl}(11, 10, 0, 0, 11, 1)_{49771}$$

$$\ell_1 = \left[\begin{array}{cccc} 1 & 0 & \delta^{10} & 0 \\ 0 & 1 & 0 & \delta^5 \end{array}\right]_{2906} = \left[\begin{array}{cccc} 1 & 0 & 10 & 0 \\ 0 & 1 & 0 & 11 \end{array}\right]_{2906} = \mathbf{Pl}(10, 11, 0, 0, 10, 1)_{45690}$$

Rank of lines: (3163, 2906)
Rank of points on Klein quadric: (49771, 45690)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

The surface has 0 Double points:
The double points on the surface are:

Single Points

The surface has 34 single points:
The single points on the surface are:

0 : $P_{29} = (10, 0, 1, 0)$ lies on line ℓ_0
1 : $P_{30} = (11, 0, 1, 0)$ lies on line ℓ_1
2 : $P_{434} = (0, 10, 0, 1)$ lies on line ℓ_1
3 : $P_{450} = (0, 11, 0, 1)$ lies on line ℓ_0
4 : $P_{700} = (11, 10, 1, 1)$ lies on line ℓ_1
5 : $P_{715} = (10, 11, 1, 1)$ lies on line ℓ_0
6 : $P_{960} = (15, 10, 2, 1)$ lies on line ℓ_1
7 : $P_{974} = (13, 11, 2, 1)$ lies on line ℓ_0
8 : $P_{1205} = (4, 10, 3, 1)$ lies on line ℓ_1
9 : $P_{1224} = (7, 11, 3, 1)$ lies on line ℓ_0
10 : $P_{1464} = (7, 10, 4, 1)$ lies on line ℓ_1
11 : $P_{1476} = (3, 11, 4, 1)$ lies on line ℓ_0
12 : $P_{1725} = (12, 10, 5, 1)$ lies on line ℓ_1
13 : $P_{1738} = (9, 11, 5, 1)$ lies on line ℓ_0
14 : $P_{1977} = (8, 10, 6, 1)$ lies on line ℓ_1
15 : $P_{1999} = (14, 11, 6, 1)$ lies on line ℓ_0
16 : $P_{2228} = (3, 10, 7, 1)$ lies on line ℓ_1
17 : $P_{2245} = (4, 11, 7, 1)$ lies on line ℓ_0
18 : $P_{2495} = (14, 10, 8, 1)$ lies on line ℓ_1
19 : $P_{2503} = (6, 11, 8, 1)$ lies on line ℓ_0
20 : $P_{2742} = (5, 10, 9, 1)$ lies on line ℓ_1
21 : $P_{2765} = (12, 11, 9, 1)$ lies on line ℓ_0
22 : $P_{2994} = (1, 10, 10, 1)$ lies on line ℓ_1
23 : $P_{3020} = (11, 11, 10, 1)$ lies on line ℓ_0
24 : $P_{3259} = (10, 10, 11, 1)$ lies on line ℓ_1
25 : $P_{3266} = (1, 11, 11, 1)$ lies on line ℓ_0
26 : $P_{3514} = (9, 10, 12, 1)$ lies on line ℓ_1
27 : $P_{3526} = (5, 11, 12, 1)$ lies on line ℓ_0
28 : $P_{3763} = (2, 10, 13, 1)$ lies on line ℓ_1
29 : $P_{3792} = (15, 11, 13, 1)$ lies on line ℓ_0
30 : $P_{4023} = (6, 10, 14, 1)$ lies on line ℓ_1
31 : $P_{4041} = (8, 11, 14, 1)$ lies on line ℓ_0
32 : $P_{4286} = (13, 10, 15, 1)$ lies on line ℓ_1
33 : $P_{4291} = (2, 11, 15, 1)$ lies on line ℓ_0

The single points on the surface are:

Points on surface but on no line

The surface has 255 points not on any line:
The points on the surface but not on lines are:

0 : $P_{20} = (1, 0, 1, 0)$
1 : $P_{35} = (0, 1, 1, 0)$
2 : $P_{45} = (10, 1, 1, 0)$
3 : $P_{46} = (11, 1, 1, 0)$
4 : $P_{66} = (15, 2, 1, 0)$
5 : $P_{86} = (3, 4, 1, 0)$
6 : $P_{168} = (5, 9, 1, 0)$
7 : $P_{179} = (0, 10, 1, 0)$
8 : $P_{183} = (4, 10, 1, 0)$
9 : $P_{193} = (14, 10, 1, 0)$

10 : $P_{195} = (0, 11, 1, 0)$
11 : $P_{197} = (2, 11, 1, 0)$
12 : $P_{204} = (9, 11, 1, 0)$
13 : $P_{251} = (8, 14, 1, 0)$
14 : $P_{290} = (0, 1, 0, 1)$
15 : $P_{318} = (12, 2, 0, 1)$
16 : $P_{329} = (7, 3, 0, 1)$
17 : $P_{332} = (10, 3, 0, 1)$
18 : $P_{337} = (15, 3, 0, 1)$
19 : $P_{344} = (6, 4, 0, 1)$
20 : $P_{357} = (3, 5, 0, 1)$
21 : $P_{365} = (11, 5, 0, 1)$
22 : $P_{366} = (12, 5, 0, 1)$
23 : $P_{383} = (13, 6, 0, 1)$
24 : $P_{398} = (12, 7, 0, 1)$
25 : $P_{407} = (5, 8, 0, 1)$
26 : $P_{408} = (6, 8, 0, 1)$
27 : $P_{412} = (10, 8, 0, 1)$
28 : $P_{431} = (13, 9, 0, 1)$
29 : $P_{445} = (11, 10, 0, 1)$
30 : $P_{460} = (10, 11, 0, 1)$
31 : $P_{472} = (6, 12, 0, 1)$
32 : $P_{489} = (7, 13, 0, 1)$
33 : $P_{505} = (7, 14, 0, 1)$
34 : $P_{522} = (8, 15, 0, 1)$
35 : $P_{525} = (11, 15, 0, 1)$
36 : $P_{527} = (13, 15, 0, 1)$
37 : $P_{530} = (0, 0, 1, 1)$
38 : $P_{531} = (1, 0, 1, 1)$
39 : $P_{566} = (5, 2, 1, 1)$
40 : $P_{571} = (10, 2, 1, 1)$
41 : $P_{573} = (12, 2, 1, 1)$
42 : $P_{599} = (6, 4, 1, 1)$
43 : $P_{601} = (8, 4, 1, 1)$
44 : $P_{604} = (11, 4, 1, 1)$
45 : $P_{683} = (10, 9, 1, 1)$
46 : $P_{686} = (13, 9, 1, 1)$
47 : $P_{688} = (15, 9, 1, 1)$
48 : $P_{756} = (3, 14, 1, 1)$
49 : $P_{760} = (7, 14, 1, 1)$
50 : $P_{764} = (11, 14, 1, 1)$
51 : $P_{810} = (9, 1, 2, 1)$
52 : $P_{828} = (11, 2, 2, 1)$
53 : $P_{852} = (3, 4, 2, 1)$
54 : $P_{860} = (11, 4, 2, 1)$
55 : $P_{862} = (13, 4, 2, 1)$
56 : $P_{883} = (2, 6, 2, 1)$
57 : $P_{892} = (11, 6, 2, 1)$
58 : $P_{895} = (14, 6, 2, 1)$
59 : $P_{915} = (2, 8, 2, 1)$
60 : $P_{943} = (14, 9, 2, 1)$
61 : $P_{981} = (4, 12, 2, 1)$
62 : $P_{982} = (5, 12, 2, 1)$
63 : $P_{989} = (12, 12, 2, 1)$
64 : $P_{1011} = (2, 14, 2, 1)$
65 : $P_{1038} = (13, 15, 2, 1)$
66 : $P_{1039} = (14, 15, 2, 1)$
67 : $P_{1063} = (6, 1, 3, 1)$
68 : $P_{1079} = (6, 2, 3, 1)$
69 : $P_{1095} = (6, 3, 3, 1)$
70 : $P_{1097} = (8, 3, 3, 1)$
71 : $P_{1101} = (12, 3, 3, 1)$
72 : $P_{1116} = (11, 4, 3, 1)$
73 : $P_{1150} = (13, 6, 3, 1)$
74 : $P_{1160} = (7, 7, 3, 1)$
75 : $P_{1181} = (12, 8, 3, 1)$
76 : $P_{1206} = (5, 10, 3, 1)$
77 : $P_{1211} = (10, 10, 3, 1)$
78 : $P_{1218} = (1, 11, 3, 1)$
79 : $P_{1229} = (12, 11, 3, 1)$
80 : $P_{1235} = (2, 12, 3, 1)$
81 : $P_{1240} = (7, 12, 3, 1)$
82 : $P_{1241} = (8, 12, 3, 1)$
83 : $P_{1263} = (14, 13, 3, 1)$
84 : $P_{1289} = (8, 15, 3, 1)$
85 : $P_{1290} = (9, 15, 3, 1)$
86 : $P_{1296} = (15, 15, 3, 1)$
87 : $P_{1327} = (14, 1, 4, 1)$
88 : $P_{1333} = (4, 2, 4, 1)$
89 : $P_{1347} = (2, 3, 4, 1)$
90 : $P_{1352} = (7, 3, 4, 1)$
91 : $P_{1371} = (10, 4, 4, 1)$
92 : $P_{1399} = (6, 6, 4, 1)$
93 : $P_{1401} = (8, 6, 4, 1)$
94 : $P_{1402} = (9, 6, 4, 1)$
95 : $P_{1446} = (5, 9, 4, 1)$
96 : $P_{1448} = (7, 9, 4, 1)$
97 : $P_{1451} = (10, 9, 4, 1)$
98 : $P_{1507} = (2, 13, 4, 1)$
99 : $P_{1509} = (4, 13, 4, 1)$
100 : $P_{1515} = (10, 13, 4, 1)$
101 : $P_{1523} = (2, 14, 4, 1)$
102 : $P_{1541} = (4, 15, 4, 1)$
103 : $P_{1582} = (13, 1, 5, 1)$
104 : $P_{1604} = (3, 3, 5, 1)$
105 : $P_{1615} = (14, 3, 5, 1)$
106 : $P_{1616} = (15, 3, 5, 1)$
107 : $P_{1630} = (13, 4, 5, 1)$
108 : $P_{1639} = (6, 5, 5, 1)$
109 : $P_{1646} = (13, 5, 5, 1)$
110 : $P_{1648} = (15, 5, 5, 1)$
111 : $P_{1653} = (4, 6, 5, 1)$
112 : $P_{1661} = (12, 6, 5, 1)$
113 : $P_{1664} = (15, 6, 5, 1)$
114 : $P_{1667} = (2, 7, 5, 1)$
115 : $P_{1707} = (10, 9, 5, 1)$
116 : $P_{1714} = (1, 10, 5, 1)$
117 : $P_{1719} = (6, 10, 5, 1)$

$118: P_{1737} = (8, 11, 5, 1)$
$119: P_{1740} = (11, 11, 5, 1)$
$120: P_{1757} = (12, 12, 5, 1)$
$121: P_{1768} = (7, 13, 5, 1)$
$122: P_{1799} = (6, 15, 5, 1)$
$123: P_{1828} = (3, 1, 6, 1)$
$124: P_{1846} = (5, 2, 6, 1)$
$125: P_{1968} = (15, 9, 6, 1)$
$126: P_{2030} = (13, 13, 6, 1)$
$127: P_{2034} = (1, 14, 6, 1)$
$128: P_{2035} = (2, 14, 6, 1)$
$129: P_{2045} = (12, 14, 6, 1)$
$130: P_{2060} = (11, 15, 6, 1)$
$131: P_{2089} = (8, 1, 7, 1)$
$132: P_{2102} = (5, 2, 7, 1)$
$133: P_{2130} = (1, 4, 7, 1)$
$134: P_{2138} = (9, 4, 7, 1)$
$135: P_{2142} = (13, 4, 7, 1)$
$136: P_{2156} = (11, 5, 7, 1)$
$137: P_{2224} = (15, 9, 7, 1)$
$138: P_{2269} = (12, 12, 7, 1)$
$139: P_{2344} = (7, 1, 8, 1)$
$140: P_{2382} = (13, 3, 8, 1)$
$141: P_{2403} = (2, 5, 8, 1)$
$142: P_{2404} = (3, 5, 8, 1)$
$143: P_{2406} = (5, 5, 8, 1)$
$144: P_{2423} = (6, 6, 8, 1)$
$145: P_{2445} = (12, 7, 8, 1)$
$146: P_{2452} = (3, 8, 8, 1)$
$147: P_{2456} = (7, 8, 8, 1)$
$148: P_{2462} = (13, 8, 8, 1)$
$149: P_{2472} = (7, 9, 8, 1)$
$150: P_{2491} = (10, 10, 8, 1)$
$151: P_{2496} = (15, 10, 8, 1)$
$152: P_{2498} = (1, 11, 8, 1)$
$153: P_{2510} = (13, 11, 8, 1)$
$154: P_{2517} = (4, 12, 8, 1)$
$155: P_{2532} = (3, 13, 8, 1)$
$156: P_{2535} = (6, 13, 8, 1)$
$157: P_{2538} = (9, 13, 8, 1)$
$158: P_{2556} = (11, 14, 8, 1)$
$159: P_{2595} = (2, 1, 9, 1)$
$160: P_{2613} = (4, 2, 9, 1)$
$161: P_{2634} = (9, 3, 9, 1)$
$162: P_{2650} = (9, 4, 9, 1)$
$163: P_{2661} = (4, 5, 9, 1)$
$164: P_{2669} = (12, 5, 9, 1)$
$165: P_{2693} = (4, 7, 9, 1)$
$166: P_{2698} = (9, 7, 9, 1)$
$167: P_{2700} = (11, 7, 9, 1)$
$168: P_{2732} = (11, 9, 9, 1)$
$169: P_{2798} = (13, 13, 9, 1)$
$170: P_{2799} = (14, 13, 9, 1)$
$171: P_{2800} = (15, 13, 9, 1)$
$172: P_{2809} = (8, 14, 9, 1)$
$173: P_{2812} = (11, 14, 9, 1)$
$174: P_{2813} = (12, 14, 9, 1)$
$175: P_{2833} = (0, 0, 10, 1)$
$176: P_{2834} = (1, 0, 10, 1)$
$177: P_{2892} = (11, 3, 10, 1)$
$178: P_{2902} = (5, 4, 10, 1)$
$179: P_{2912} = (15, 4, 10, 1)$
$180: P_{2972} = (11, 8, 10, 1)$
$181: P_{2998} = (5, 10, 10, 1)$
$182: P_{3008} = (15, 10, 10, 1)$
$183: P_{3021} = (12, 11, 10, 1)$
$184: P_{3022} = (13, 11, 10, 1)$
$185: P_{3029} = (4, 12, 10, 1)$
$186: P_{3055} = (14, 13, 10, 1)$
$187: P_{3062} = (5, 14, 10, 1)$
$188: P_{3072} = (15, 14, 10, 1)$
$189: P_{3089} = (0, 0, 11, 1)$
$190: P_{3090} = (1, 0, 11, 1)$
$191: P_{3124} = (3, 2, 11, 1)$
$192: P_{3129} = (8, 2, 11, 1)$
$193: P_{3179} = (10, 5, 11, 1)$
$194: P_{3194} = (9, 6, 11, 1)$
$195: P_{3203} = (2, 7, 11, 1)$
$196: P_{3236} = (3, 9, 11, 1)$
$197: P_{3241} = (8, 9, 11, 1)$
$198: P_{3255} = (6, 10, 11, 1)$
$199: P_{3256} = (7, 10, 11, 1)$
$200: P_{3268} = (3, 11, 11, 1)$
$201: P_{3273} = (8, 11, 11, 1)$
$202: P_{3339} = (10, 15, 11, 1)$
$203: P_{3376} = (15, 1, 12, 1)$
$204: P_{3417} = (8, 4, 12, 1)$
$205: P_{3447} = (6, 6, 12, 1)$
$206: P_{3483} = (10, 8, 12, 1)$
$207: P_{3490} = (1, 9, 12, 1)$
$208: P_{3496} = (7, 9, 12, 1)$
$209: P_{3503} = (14, 9, 12, 1)$
$210: P_{3572} = (3, 14, 12, 1)$
$211: P_{3622} = (5, 1, 13, 1)$
$212: P_{3634} = (1, 2, 13, 1)$
$213: P_{3637} = (4, 2, 13, 1)$
$214: P_{3639} = (6, 2, 13, 1)$
$215: P_{3659} = (10, 3, 13, 1)$
$216: P_{3673} = (8, 4, 13, 1)$
$217: P_{3720} = (7, 7, 13, 1)$
$218: P_{3828} = (3, 14, 13, 1)$
$219: P_{3877} = (4, 1, 14, 1)$
$220: P_{3895} = (6, 2, 14, 1)$
$221: P_{3899} = (10, 2, 14, 1)$
$222: P_{3904} = (15, 2, 14, 1)$
$223: P_{3930} = (9, 4, 14, 1)$
$224: P_{3951} = (14, 5, 14, 1)$
$225: P_{3971} = (2, 7, 14, 1)$

226 : $P_{3972} = (3, 7, 14, 1)$
227 : $P_{3976} = (7, 7, 14, 1)$
228 : $P_{3991} = (6, 8, 14, 1)$
229 : $P_{3994} = (9, 8, 14, 1)$
230 : $P_{4015} = (14, 9, 14, 1)$
231 : $P_{4058} = (9, 12, 14, 1)$
232 : $P_{4059} = (10, 12, 14, 1)$
233 : $P_{4063} = (14, 12, 14, 1)$
234 : $P_{4091} = (10, 14, 14, 1)$
235 : $P_{4141} = (12, 1, 15, 1)$
236 : $P_{4155} = (10, 2, 15, 1)$
237 : $P_{4200} = (7, 5, 15, 1)$
238 : $P_{4218} = (9, 6, 15, 1)$
239 : $P_{4230} = (5, 7, 15, 1)$
240 : $P_{4238} = (13, 7, 15, 1)$
241 : $P_{4239} = (14, 7, 15, 1)$
242 : $P_{4245} = (4, 8, 15, 1)$
243 : $P_{4246} = (5, 8, 15, 1)$
244 : $P_{4249} = (8, 8, 15, 1)$
245 : $P_{4274} = (1, 10, 15, 1)$
246 : $P_{4280} = (7, 10, 15, 1)$
247 : $P_{4292} = (3, 11, 15, 1)$
248 : $P_{4300} = (11, 11, 15, 1)$
249 : $P_{4311} = (6, 12, 15, 1)$
250 : $P_{4334} = (13, 13, 15, 1)$
251 : $P_{4349} = (12, 14, 15, 1)$
252 : $P_{4358} = (5, 15, 15, 1)$
253 : $P_{4360} = (7, 15, 15, 1)$
254 : $P_{4365} = (12, 15, 15, 1)$

Line Intersection Graph

	0	1
0	0	0
1	0	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line
in point

Line 1 intersects

Line
in point

The surface has 289 points:
The points on the surface are:

0 : $P_{20} = (1, 0, 1, 0)$
1 : $P_{29} = (10, 0, 1, 0)$
2 : $P_{30} = (11, 0, 1, 0)$
3 : $P_{35} = (0, 1, 1, 0)$
4 : $P_{45} = (10, 1, 1, 0)$
5 : $P_{46} = (11, 1, 1, 0)$
6 : $P_{66} = (15, 2, 1, 0)$
7 : $P_{86} = (3, 4, 1, 0)$
8 : $P_{168} = (5, 9, 1, 0)$
9 : $P_{179} = (0, 10, 1, 0)$
10 : $P_{183} = (4, 10, 1, 0)$
11 : $P_{193} = (14, 10, 1, 0)$
12 : $P_{195} = (0, 11, 1, 0)$
13 : $P_{197} = (2, 11, 1, 0)$
14 : $P_{204} = (9, 11, 1, 0)$
15 : $P_{251} = (8, 14, 1, 0)$
16 : $P_{290} = (0, 1, 0, 1)$
17 : $P_{318} = (12, 2, 0, 1)$
18 : $P_{329} = (7, 3, 0, 1)$
19 : $P_{332} = (10, 3, 0, 1)$
20 : $P_{337} = (15, 3, 0, 1)$
21 : $P_{344} = (6, 4, 0, 1)$
22 : $P_{357} = (3, 5, 0, 1)$
23 : $P_{365} = (11, 5, 0, 1)$
24 : $P_{366} = (12, 5, 0, 1)$
25 : $P_{383} = (13, 6, 0, 1)$
26 : $P_{398} = (12, 7, 0, 1)$
27 : $P_{407} = (5, 8, 0, 1)$
28 : $P_{408} = (6, 8, 0, 1)$
29 : $P_{412} = (10, 8, 0, 1)$
30 : $P_{431} = (13, 9, 0, 1)$
31 : $P_{434} = (0, 10, 0, 1)$
32 : $P_{445} = (11, 10, 0, 1)$
33 : $P_{450} = (0, 11, 0, 1)$
34 : $P_{460} = (10, 11, 0, 1)$
35 : $P_{472} = (6, 12, 0, 1)$
36 : $P_{489} = (7, 13, 0, 1)$
37 : $P_{505} = (7, 14, 0, 1)$
38 : $P_{522} = (8, 15, 0, 1)$
39 : $P_{525} = (11, 15, 0, 1)$
40 : $P_{527} = (13, 15, 0, 1)$
41 : $P_{530} = (0, 0, 1, 1)$
42 : $P_{531} = (1, 0, 1, 1)$
43 : $P_{566} = (5, 2, 1, 1)$
44 : $P_{571} = (10, 2, 1, 1)$
45 : $P_{573} = (12, 2, 1, 1)$
46 : $P_{599} = (6, 4, 1, 1)$
47 : $P_{601} = (8, 4, 1, 1)$
48 : $P_{604} = (11, 4, 1, 1)$
49 : $P_{683} = (10, 9, 1, 1)$
50 : $P_{686} = (13, 9, 1, 1)$
51 : $P_{688} = (15, 9, 1, 1)$
52 : $P_{700} = (11, 10, 1, 1)$
53 : $P_{715} = (10, 11, 1, 1)$
54 : $P_{756} = (3, 14, 1, 1)$
55 : $P_{760} = (7, 14, 1, 1)$
56 : $P_{764} = (11, 14, 1, 1)$
57 : $P_{810} = (9, 1, 2, 1)$
58 : $P_{828} = (11, 2, 2, 1)$
59 : $P_{852} = (3, 4, 2, 1)$
60 : $P_{860} = (11, 4, 2, 1)$
61 : $P_{862} = (13, 4, 2, 1)$
62 : $P_{883} = (2, 6, 2, 1)$

63 : $P_{892} = (11, 6, 2, 1)$
64 : $P_{895} = (14, 6, 2, 1)$
65 : $P_{915} = (2, 8, 2, 1)$
66 : $P_{943} = (14, 9, 2, 1)$
67 : $P_{960} = (15, 10, 2, 1)$
68 : $P_{974} = (13, 11, 2, 1)$
69 : $P_{981} = (4, 12, 2, 1)$
70 : $P_{982} = (5, 12, 2, 1)$
71 : $P_{989} = (12, 12, 2, 1)$
72 : $P_{1011} = (2, 14, 2, 1)$
73 : $P_{1038} = (13, 15, 2, 1)$
74 : $P_{1039} = (14, 15, 2, 1)$
75 : $P_{1063} = (6, 1, 3, 1)$
76 : $P_{1079} = (6, 2, 3, 1)$
77 : $P_{1095} = (6, 3, 3, 1)$
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80 : $P_{1116} = (11, 4, 3, 1)$
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83 : $P_{1181} = (12, 8, 3, 1)$
84 : $P_{1205} = (4, 10, 3, 1)$
85 : $P_{1206} = (5, 10, 3, 1)$
86 : $P_{1211} = (10, 10, 3, 1)$
87 : $P_{1218} = (1, 11, 3, 1)$
88 : $P_{1224} = (7, 11, 3, 1)$
89 : $P_{1229} = (12, 11, 3, 1)$
90 : $P_{1235} = (2, 12, 3, 1)$
91 : $P_{1240} = (7, 12, 3, 1)$
92 : $P_{1241} = (8, 12, 3, 1)$
93 : $P_{1263} = (14, 13, 3, 1)$
94 : $P_{1289} = (8, 15, 3, 1)$
95 : $P_{1290} = (9, 15, 3, 1)$
96 : $P_{1296} = (15, 15, 3, 1)$
97 : $P_{1327} = (14, 1, 4, 1)$
98 : $P_{1333} = (4, 2, 4, 1)$
99 : $P_{1347} = (2, 3, 4, 1)$
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101 : $P_{1371} = (10, 4, 4, 1)$
102 : $P_{1399} = (6, 6, 4, 1)$
103 : $P_{1401} = (8, 6, 4, 1)$
104 : $P_{1402} = (9, 6, 4, 1)$
105 : $P_{1446} = (5, 9, 4, 1)$
106 : $P_{1448} = (7, 9, 4, 1)$
107 : $P_{1451} = (10, 9, 4, 1)$
108 : $P_{1464} = (7, 10, 4, 1)$
109 : $P_{1476} = (3, 11, 4, 1)$
110 : $P_{1507} = (2, 13, 4, 1)$
111 : $P_{1509} = (4, 13, 4, 1)$
112 : $P_{1515} = (10, 13, 4, 1)$
113 : $P_{1523} = (2, 14, 4, 1)$
114 : $P_{1541} = (4, 15, 4, 1)$
115 : $P_{1582} = (13, 1, 5, 1)$
116 : $P_{1604} = (3, 3, 5, 1)$
117 : $P_{1615} = (14, 3, 5, 1)$
118 : $P_{1616} = (15, 3, 5, 1)$
119 : $P_{1630} = (13, 4, 5, 1)$
120 : $P_{1639} = (6, 5, 5, 1)$
121 : $P_{1646} = (13, 5, 5, 1)$
122 : $P_{1648} = (15, 5, 5, 1)$
123 : $P_{1653} = (4, 6, 5, 1)$
124 : $P_{1661} = (12, 6, 5, 1)$
125 : $P_{1664} = (15, 6, 5, 1)$
126 : $P_{1667} = (2, 7, 5, 1)$
127 : $P_{1707} = (10, 9, 5, 1)$
128 : $P_{1714} = (1, 10, 5, 1)$
129 : $P_{1719} = (6, 10, 5, 1)$
130 : $P_{1725} = (12, 10, 5, 1)$
131 : $P_{1737} = (8, 11, 5, 1)$
132 : $P_{1738} = (9, 11, 5, 1)$
133 : $P_{1740} = (11, 11, 5, 1)$
134 : $P_{1757} = (12, 12, 5, 1)$
135 : $P_{1768} = (7, 13, 5, 1)$
136 : $P_{1799} = (6, 15, 5, 1)$
137 : $P_{1828} = (3, 1, 6, 1)$
138 : $P_{1846} = (5, 2, 6, 1)$
139 : $P_{1968} = (15, 9, 6, 1)$
140 : $P_{1977} = (8, 10, 6, 1)$
141 : $P_{1999} = (14, 11, 6, 1)$
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143 : $P_{2034} = (1, 14, 6, 1)$
144 : $P_{2035} = (2, 14, 6, 1)$
145 : $P_{2045} = (12, 14, 6, 1)$
146 : $P_{2060} = (11, 15, 6, 1)$
147 : $P_{2089} = (8, 1, 7, 1)$
148 : $P_{2102} = (5, 2, 7, 1)$
149 : $P_{2130} = (1, 4, 7, 1)$
150 : $P_{2138} = (9, 4, 7, 1)$
151 : $P_{2142} = (13, 4, 7, 1)$
152 : $P_{2156} = (11, 5, 7, 1)$
153 : $P_{2224} = (15, 9, 7, 1)$
154 : $P_{2228} = (3, 10, 7, 1)$
155 : $P_{2245} = (4, 11, 7, 1)$
156 : $P_{2269} = (12, 12, 7, 1)$
157 : $P_{2344} = (7, 1, 8, 1)$
158 : $P_{2382} = (13, 3, 8, 1)$
159 : $P_{2403} = (2, 5, 8, 1)$
160 : $P_{2404} = (3, 5, 8, 1)$
161 : $P_{2406} = (5, 5, 8, 1)$
162 : $P_{2423} = (6, 6, 8, 1)$
163 : $P_{2445} = (12, 7, 8, 1)$
164 : $P_{2452} = (3, 8, 8, 1)$
165 : $P_{2456} = (7, 8, 8, 1)$
166 : $P_{2462} = (13, 8, 8, 1)$
167 : $P_{2472} = (7, 9, 8, 1)$
168 : $P_{2491} = (10, 10, 8, 1)$
169 : $P_{2495} = (14, 10, 8, 1)$
170 : $P_{2496} = (15, 10, 8, 1)$
171 : $P_{2498} = (1, 11, 8, 1)$
172 : $P_{2503} = (6, 11, 8, 1)$
173 : $P_{2510} = (13, 11, 8, 1)$
174 : $P_{2517} = (4, 12, 8, 1)$
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176 : $P_{2535} = (6, 13, 8, 1)$
177 : $P_{2538} = (9, 13, 8, 1)$
178 : $P_{2556} = (11, 14, 8, 1)$
179 : $P_{2595} = (2, 1, 9, 1)$
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181 : $P_{2634} = (9, 3, 9, 1)$
182 : $P_{2650} = (9, 4, 9, 1)$
183 : $P_{2661} = (4, 5, 9, 1)$
184 : $P_{2669} = (12, 5, 9, 1)$
185 : $P_{2693} = (4, 7, 9, 1)$
186 : $P_{2698} = (9, 7, 9, 1)$
187 : $P_{2700} = (11, 7, 9, 1)$
188 : $P_{2732} = (11, 9, 9, 1)$
189 : $P_{2742} = (5, 10, 9, 1)$
190 : $P_{2765} = (12, 11, 9, 1)$
191 : $P_{2798} = (13, 13, 9, 1)$
192 : $P_{2799} = (14, 13, 9, 1)$
193 : $P_{2800} = (15, 13, 9, 1)$
194 : $P_{2809} = (8, 14, 9, 1)$
195 : $P_{2812} = (11, 14, 9, 1)$
196 : $P_{2813} = (12, 14, 9, 1)$
197 : $P_{2833} = (0, 0, 10, 1)$
198 : $P_{2834} = (1, 0, 10, 1)$
199 : $P_{2892} = (11, 3, 10, 1)$
200 : $P_{2902} = (5, 4, 10, 1)$
201 : $P_{2912} = (15, 4, 10, 1)$
202 : $P_{2972} = (11, 8, 10, 1)$
203 : $P_{2994} = (1, 10, 10, 1)$
204 : $P_{2998} = (5, 10, 10, 1)$
205 : $P_{3008} = (15, 10, 10, 1)$
206 : $P_{3020} = (11, 11, 10, 1)$
207 : $P_{3021} = (12, 11, 10, 1)$
208 : $P_{3022} = (13, 11, 10, 1)$
209 : $P_{3029} = (4, 12, 10, 1)$
210 : $P_{3055} = (14, 13, 10, 1)$
211 : $P_{3062} = (5, 14, 10, 1)$
212 : $P_{3072} = (15, 14, 10, 1)$
213 : $P_{3089} = (0, 0, 11, 1)$
214 : $P_{3090} = (1, 0, 11, 1)$
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216 : $P_{3129} = (8, 2, 11, 1)$
217 : $P_{3179} = (10, 5, 11, 1)$
218 : $P_{3194} = (9, 6, 11, 1)$
219 : $P_{3203} = (2, 7, 11, 1)$
220 : $P_{3236} = (3, 9, 11, 1)$
221 : $P_{3241} = (8, 9, 11, 1)$
222 : $P_{3255} = (6, 10, 11, 1)$
223 : $P_{3256} = (7, 10, 11, 1)$
224 : $P_{3259} = (10, 10, 11, 1)$

225 : $P_{3266} = (1, 11, 11, 1)$
226 : $P_{3268} = (3, 11, 11, 1)$
227 : $P_{3273} = (8, 11, 11, 1)$
228 : $P_{3339} = (10, 15, 11, 1)$
229 : $P_{3376} = (15, 1, 12, 1)$
230 : $P_{3417} = (8, 4, 12, 1)$
231 : $P_{3447} = (6, 6, 12, 1)$
232 : $P_{3483} = (10, 8, 12, 1)$
233 : $P_{3490} = (1, 9, 12, 1)$
234 : $P_{3496} = (7, 9, 12, 1)$
235 : $P_{3503} = (14, 9, 12, 1)$
236 : $P_{3514} = (9, 10, 12, 1)$
237 : $P_{3526} = (5, 11, 12, 1)$
238 : $P_{3572} = (3, 14, 12, 1)$
239 : $P_{3622} = (5, 1, 13, 1)$
240 : $P_{3634} = (1, 2, 13, 1)$
241 : $P_{3637} = (4, 2, 13, 1)$
242 : $P_{3639} = (6, 2, 13, 1)$
243 : $P_{3659} = (10, 3, 13, 1)$
244 : $P_{3673} = (8, 4, 13, 1)$
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247 : $P_{3792} = (15, 11, 13, 1)$
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249 : $P_{3877} = (4, 1, 14, 1)$
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251 : $P_{3899} = (10, 2, 14, 1)$
252 : $P_{3904} = (15, 2, 14, 1)$
253 : $P_{3930} = (9, 4, 14, 1)$
254 : $P_{3951} = (14, 5, 14, 1)$
255 : $P_{3971} = (2, 7, 14, 1)$
256 : $P_{3972} = (3, 7, 14, 1)$
257 : $P_{3976} = (7, 7, 14, 1)$
258 : $P_{3991} = (6, 8, 14, 1)$
259 : $P_{3994} = (9, 8, 14, 1)$
260 : $P_{4015} = (14, 9, 14, 1)$
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262 : $P_{4041} = (8, 11, 14, 1)$
263 : $P_{4058} = (9, 12, 14, 1)$
264 : $P_{4059} = (10, 12, 14, 1)$
265 : $P_{4063} = (14, 12, 14, 1)$
266 : $P_{4091} = (10, 14, 14, 1)$
267 : $P_{4141} = (12, 1, 15, 1)$
268 : $P_{4155} = (10, 2, 15, 1)$
269 : $P_{4200} = (7, 5, 15, 1)$
270 : $P_{4218} = (9, 6, 15, 1)$
271 : $P_{4230} = (5, 7, 15, 1)$
272 : $P_{4238} = (13, 7, 15, 1)$
273 : $P_{4239} = (14, 7, 15, 1)$
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276 : $P_{4249} = (8, 8, 15, 1)$
277 : $P_{4274} = (1, 10, 15, 1)$
278 : $P_{4280} = (7, 10, 15, 1)$
279 : $P_{4286} = (13, 10, 15, 1)$
280 : $P_{4291} = (2, 11, 15, 1)$
281 : $P_{4292} = (3, 11, 15, 1)$
282 : $P_{4300} = (11, 11, 15, 1)$
283 : $P_{4311} = (6, 12, 15, 1)$
284 : $P_{4334} = (13, 13, 15, 1)$
285 : $P_{4349} = (12, 14, 15, 1)$
286 : $P_{4358} = (5, 15, 15, 1)$
287 : $P_{4360} = (7, 15, 15, 1)$
288 : $P_{4365} = (12, 15, 15, 1)$