

# Rank-362 over GF(16)

January 15, 2021

## The equation

The equation of the surface is :

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

( 1, 1, 1, 1, 1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0 )

The point rank of the equation over GF(16) is 303178286

## 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:

$$\begin{aligned}\ell_0 &= \left[ \begin{array}{cccc} 1 & 0 & \delta^5 & 0 \\ 0 & 1 & 1 & \delta^5 \end{array} \right]_{3180} = \left[ \begin{array}{cccc} 1 & 0 & 11 & 0 \\ 0 & 1 & 1 & 11 \end{array} \right]_{3180} = \mathbf{Pl}(10, 11, 10, 0, 1, 1)_{9120} \\ \ell_1 &= \left[ \begin{array}{cccc} 1 & 0 & \delta^{10} & 0 \\ 0 & 1 & 1 & \delta^{10} \end{array} \right]_{2891} = \left[ \begin{array}{cccc} 1 & 0 & 10 & 0 \\ 0 & 1 & 1 & 10 \end{array} \right]_{2891} = \mathbf{Pl}(11, 10, 11, 0, 1, 1)_{9136}\end{aligned}$$

Rank of lines: ( 3180, 2891 )  
Rank of points on Klein quadric: ( 9120, 9136 )

### 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 $\ell_0$     | 18 : $P_{2494} = (13, 10, 8, 1)$ lies on line $\ell_0$  |
| 1 : $P_{30} = (11, 0, 1, 0)$ lies on line $\ell_1$     | 19 : $P_{2501} = (4, 11, 8, 1)$ lies on line $\ell_1$   |
| 2 : $P_{445} = (11, 10, 0, 1)$ lies on line $\ell_0$   | 20 : $P_{2744} = (7, 10, 9, 1)$ lies on line $\ell_0$   |
| 3 : $P_{460} = (10, 11, 0, 1)$ lies on line $\ell_1$   | 21 : $P_{2768} = (15, 11, 9, 1)$ lies on line $\ell_1$  |
| 4 : $P_{690} = (1, 10, 1, 1)$ lies on line $\ell_0$    | 22 : $P_{2993} = (0, 10, 10, 1)$ lies on line $\ell_0$  |
| 5 : $P_{706} = (1, 11, 1, 1)$ lies on line $\ell_1$    | 23 : $P_{3020} = (11, 11, 10, 1)$ lies on line $\ell_1$ |
| 6 : $P_{951} = (6, 10, 2, 1)$ lies on line $\ell_0$    | 24 : $P_{3259} = (10, 10, 11, 1)$ lies on line $\ell_0$ |
| 7 : $P_{966} = (5, 11, 2, 1)$ lies on line $\ell_1$    | 25 : $P_{3265} = (0, 11, 11, 1)$ lies on line $\ell_1$  |
| 8 : $P_{1213} = (12, 10, 3, 1)$ lies on line $\ell_0$  | 26 : $P_{3519} = (14, 10, 12, 1)$ lies on line $\ell_0$ |
| 9 : $P_{1231} = (14, 11, 3, 1)$ lies on line $\ell_1$  | 27 : $P_{3524} = (3, 11, 12, 1)$ lies on line $\ell_1$  |
| 10 : $P_{1465} = (8, 10, 4, 1)$ lies on line $\ell_0$  | 28 : $P_{3765} = (4, 10, 13, 1)$ lies on line $\ell_0$  |
| 11 : $P_{1486} = (13, 11, 4, 1)$ lies on line $\ell_1$ | 29 : $P_{3785} = (8, 11, 13, 1)$ lies on line $\ell_1$  |
| 12 : $P_{1715} = (2, 10, 5, 1)$ lies on line $\ell_0$  | 30 : $P_{4020} = (3, 10, 14, 1)$ lies on line $\ell_0$  |
| 13 : $P_{1735} = (6, 11, 5, 1)$ lies on line $\ell_1$  | 31 : $P_{4045} = (12, 11, 14, 1)$ lies on line $\ell_1$ |
| 14 : $P_{1974} = (5, 10, 6, 1)$ lies on line $\ell_0$  | 32 : $P_{4282} = (9, 10, 15, 1)$ lies on line $\ell_0$  |
| 15 : $P_{1987} = (2, 11, 6, 1)$ lies on line $\ell_1$  | 33 : $P_{4296} = (7, 11, 15, 1)$ lies on line $\ell_1$  |
| 16 : $P_{2240} = (15, 10, 7, 1)$ lies on line $\ell_0$ |   |
| 17 : $P_{2250} = (9, 11, 7, 1)$ lies on line $\ell_1$  |   |

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 : $P_{20} = (1, 0, 1, 0)$   | 5 : $P_{129} = (14, 6, 1, 0)$ |
| 1 : $P_{73} = (6, 3, 1, 0)$   | 6 : $P_{135} = (4, 7, 1, 0)$  |
| 2 : $P_{112} = (13, 5, 1, 0)$ | 7 : $P_{140} = (9, 7, 1, 0)$  |
| 3 : $P_{117} = (2, 6, 1, 0)$  | 8 : $P_{141} = (10, 7, 1, 0)$ |
| 4 : $P_{125} = (10, 6, 1, 0)$ | 9 : $P_{154} = (7, 8, 1, 0)$  |

10 : $P_{180} = (1, 10, 1, 0)$	64 : $P_{871} = (6, 5, 2, 1)$
11 : $P_{181} = (2, 10, 1, 0)$	65 : $P_{898} = (1, 7, 2, 1)$
12 : $P_{188} = (9, 10, 1, 0)$	66 : $P_{939} = (10, 9, 2, 1)$
13 : $P_{196} = (1, 11, 1, 0)$	67 : $P_{989} = (12, 12, 2, 1)$
14 : $P_{199} = (4, 11, 1, 0)$	68 : $P_{991} = (14, 12, 2, 1)$
15 : $P_{209} = (14, 11, 1, 0)$	69 : $P_{992} = (15, 12, 2, 1)$
16 : $P_{220} = (9, 12, 1, 0)$	70 : $P_{999} = (6, 13, 2, 1)$
17 : $P_{222} = (11, 12, 1, 0)$	71 : $P_{1035} = (10, 15, 2, 1)$
18 : $P_{225} = (14, 12, 1, 0)$	72 : $P_{1096} = (7, 3, 3, 1)$
19 : $P_{229} = (2, 13, 1, 0)$	73 : $P_{1099} = (10, 3, 3, 1)$
20 : $P_{231} = (4, 13, 1, 0)$	74 : $P_{1104} = (15, 3, 3, 1)$
21 : $P_{238} = (11, 13, 1, 0)$	75 : $P_{1148} = (11, 6, 3, 1)$
22 : $P_{271} = (12, 15, 1, 0)$	76 : $P_{1160} = (7, 7, 3, 1)$
23 : $P_{290} = (0, 1, 0, 1)$	77 : $P_{1161} = (8, 7, 3, 1)$
24 : $P_{318} = (12, 2, 0, 1)$	78 : $P_{1162} = (9, 7, 3, 1)$
25 : $P_{329} = (7, 3, 0, 1)$	79 : $P_{1211} = (10, 10, 3, 1)$
26 : $P_{332} = (10, 3, 0, 1)$	80 : $P_{1214} = (13, 10, 3, 1)$
27 : $P_{337} = (15, 3, 0, 1)$	81 : $P_{1255} = (6, 13, 3, 1)$
28 : $P_{344} = (6, 4, 0, 1)$	82 : $P_{1296} = (15, 15, 3, 1)$
29 : $P_{357} = (3, 5, 0, 1)$	83 : $P_{1356} = (11, 3, 4, 1)$
30 : $P_{365} = (11, 5, 0, 1)$	84 : $P_{1367} = (6, 4, 4, 1)$
31 : $P_{366} = (12, 5, 0, 1)$	85 : $P_{1387} = (10, 5, 4, 1)$
32 : $P_{383} = (13, 6, 0, 1)$	86 : $P_{1395} = (2, 6, 4, 1)$
33 : $P_{398} = (12, 7, 0, 1)$	87 : $P_{1396} = (3, 6, 4, 1)$
34 : $P_{407} = (5, 8, 0, 1)$	88 : $P_{1399} = (6, 6, 4, 1)$
35 : $P_{408} = (6, 8, 0, 1)$	89 : $P_{1422} = (13, 7, 4, 1)$
36 : $P_{412} = (10, 8, 0, 1)$	90 : $P_{1438} = (13, 8, 4, 1)$
37 : $P_{431} = (13, 9, 0, 1)$	91 : $P_{1452} = (11, 9, 4, 1)$
38 : $P_{434} = (0, 10, 0, 1)$	92 : $P_{1490} = (1, 12, 4, 1)$
39 : $P_{450} = (0, 11, 0, 1)$	93 : $P_{1532} = (11, 14, 4, 1)$
40 : $P_{472} = (6, 12, 0, 1)$	94 : $P_{1604} = (3, 3, 5, 1)$
41 : $P_{489} = (7, 13, 0, 1)$	95 : $P_{1636} = (3, 5, 5, 1)$
42 : $P_{505} = (7, 14, 0, 1)$	96 : $P_{1644} = (11, 5, 5, 1)$
43 : $P_{522} = (8, 15, 0, 1)$	97 : $P_{1645} = (12, 5, 5, 1)$
44 : $P_{525} = (11, 15, 0, 1)$	98 : $P_{1678} = (13, 7, 5, 1)$
45 : $P_{527} = (13, 15, 0, 1)$	99 : $P_{1736} = (7, 11, 5, 1)$
46 : $P_{530} = (0, 0, 1, 1)$	100 : $P_{1740} = (11, 11, 5, 1)$
47 : $P_{531} = (1, 0, 1, 1)$	101 : $P_{1757} = (12, 12, 5, 1)$
48 : $P_{546} = (0, 1, 1, 1)$	102 : $P_{1759} = (14, 12, 5, 1)$
49 : $P_{582} = (5, 3, 1, 1)$	103 : $P_{1760} = (15, 12, 5, 1)$
50 : $P_{617} = (8, 5, 1, 1)$	104 : $P_{1771} = (10, 13, 5, 1)$
51 : $P_{637} = (12, 6, 1, 1)$	105 : $P_{1830} = (5, 1, 6, 1)$
52 : $P_{654} = (13, 7, 1, 1)$	106 : $P_{1834} = (9, 1, 6, 1)$
53 : $P_{672} = (15, 8, 1, 1)$	107 : $P_{1837} = (12, 1, 6, 1)$
54 : $P_{693} = (4, 10, 1, 1)$	108 : $P_{1845} = (4, 2, 6, 1)$
55 : $P_{703} = (14, 10, 1, 1)$	109 : $P_{1849} = (8, 2, 6, 1)$
56 : $P_{707} = (2, 11, 1, 1)$	110 : $P_{1856} = (15, 2, 6, 1)$
57 : $P_{714} = (9, 11, 1, 1)$	111 : $P_{1868} = (11, 3, 6, 1)$
58 : $P_{728} = (7, 12, 1, 1)$	112 : $P_{1887} = (14, 4, 6, 1)$
59 : $P_{743} = (6, 13, 1, 1)$	113 : $P_{1890} = (1, 5, 6, 1)$
60 : $P_{772} = (3, 15, 1, 1)$	114 : $P_{1918} = (13, 6, 6, 1)$
61 : $P_{829} = (12, 2, 2, 1)$	115 : $P_{1924} = (3, 7, 6, 1)$
62 : $P_{844} = (11, 3, 2, 1)$	116 : $P_{1938} = (1, 8, 6, 1)$
63 : $P_{859} = (10, 4, 2, 1)$	117 : $P_{1957} = (4, 9, 6, 1)$

118 : $P_{1986} = (1, 11, 6, 1)$	172 : $P_{2963} = (2, 8, 10, 1)$
119 : $P_{1994} = (9, 11, 6, 1)$	173 : $P_{2968} = (7, 8, 10, 1)$
120 : $P_{2010} = (9, 12, 6, 1)$	174 : $P_{2973} = (12, 8, 10, 1)$
121 : $P_{2021} = (4, 13, 6, 1)$	175 : $P_{2984} = (7, 9, 10, 1)$
122 : $P_{2022} = (5, 13, 6, 1)$	176 : $P_{3004} = (11, 10, 10, 1)$
123 : $P_{2030} = (13, 13, 6, 1)$	177 : $P_{3015} = (6, 11, 10, 1)$
124 : $P_{2083} = (2, 1, 7, 1)$	178 : $P_{3016} = (7, 11, 10, 1)$
125 : $P_{2094} = (13, 1, 7, 1)$	179 : $P_{3074} = (1, 15, 10, 1)$
126 : $P_{2096} = (15, 1, 7, 1)$	180 : $P_{3089} = (0, 0, 11, 1)$
127 : $P_{2111} = (14, 2, 7, 1)$	181 : $P_{3090} = (1, 0, 11, 1)$
128 : $P_{2114} = (1, 3, 7, 1)$	182 : $P_{3138} = (1, 3, 11, 1)$
129 : $P_{2169} = (8, 6, 7, 1)$	183 : $P_{3166} = (13, 4, 11, 1)$
130 : $P_{2189} = (12, 7, 7, 1)$	184 : $P_{3176} = (7, 5, 11, 1)$
131 : $P_{2204} = (11, 8, 7, 1)$	185 : $P_{3182} = (13, 5, 11, 1)$
132 : $P_{2212} = (3, 9, 7, 1)$	186 : $P_{3183} = (14, 5, 11, 1)$
133 : $P_{2214} = (5, 9, 7, 1)$	187 : $P_{3218} = (1, 8, 11, 1)$
134 : $P_{2223} = (14, 9, 7, 1)$	188 : $P_{3261} = (12, 10, 11, 1)$
135 : $P_{2242} = (1, 11, 7, 1)$	189 : $P_{3262} = (13, 10, 11, 1)$
136 : $P_{2243} = (2, 11, 7, 1)$	190 : $P_{3275} = (10, 11, 11, 1)$
137 : $P_{2269} = (12, 12, 7, 1)$	191 : $P_{3325} = (12, 14, 11, 1)$
138 : $P_{2271} = (14, 12, 7, 1)$	192 : $P_{3333} = (4, 15, 11, 1)$
139 : $P_{2272} = (15, 12, 7, 1)$	193 : $P_{3335} = (6, 15, 11, 1)$
140 : $P_{2275} = (2, 13, 7, 1)$	194 : $P_{3341} = (12, 15, 11, 1)$
141 : $P_{2293} = (4, 14, 7, 1)$	195 : $P_{3364} = (3, 1, 12, 1)$
142 : $P_{2306} = (1, 15, 7, 1)$	196 : $P_{3365} = (4, 1, 12, 1)$
143 : $P_{2406} = (5, 5, 8, 1)$	197 : $P_{3368} = (7, 1, 12, 1)$
144 : $P_{2419} = (2, 6, 8, 1)$	198 : $P_{3386} = (9, 2, 12, 1)$
145 : $P_{2420} = (3, 6, 8, 1)$	199 : $P_{3394} = (1, 3, 12, 1)$
146 : $P_{2423} = (6, 6, 8, 1)$	200 : $P_{3411} = (2, 4, 12, 1)$
147 : $P_{2444} = (11, 7, 8, 1)$	201 : $P_{3426} = (1, 5, 12, 1)$
148 : $P_{2454} = (5, 8, 8, 1)$	202 : $P_{3443} = (2, 6, 12, 1)$
149 : $P_{2455} = (6, 8, 8, 1)$	203 : $P_{3444} = (3, 6, 12, 1)$
150 : $P_{2459} = (10, 8, 8, 1)$	204 : $P_{3447} = (6, 6, 12, 1)$
151 : $P_{2491} = (10, 10, 8, 1)$	205 : $P_{3461} = (4, 7, 12, 1)$
152 : $P_{2493} = (12, 10, 8, 1)$	206 : $P_{3506} = (1, 10, 12, 1)$
153 : $P_{2520} = (7, 12, 8, 1)$	207 : $P_{3509} = (4, 10, 12, 1)$
154 : $P_{2619} = (10, 2, 9, 1)$	208 : $P_{3543} = (6, 12, 12, 1)$
155 : $P_{2667} = (10, 5, 9, 1)$	209 : $P_{3568} = (15, 13, 12, 1)$
156 : $P_{2674} = (1, 6, 9, 1)$	210 : $P_{3571} = (2, 14, 12, 1)$
157 : $P_{2716} = (11, 8, 9, 1)$	211 : $P_{3574} = (5, 14, 12, 1)$
158 : $P_{2734} = (13, 9, 9, 1)$	212 : $P_{3577} = (8, 14, 12, 1)$
159 : $P_{2776} = (7, 12, 9, 1)$	213 : $P_{3595} = (10, 15, 12, 1)$
160 : $P_{2789} = (4, 13, 9, 1)$	214 : $P_{3623} = (6, 1, 13, 1)$
161 : $P_{2790} = (5, 13, 9, 1)$	215 : $P_{3625} = (8, 1, 13, 1)$
162 : $P_{2798} = (13, 13, 9, 1)$	216 : $P_{3631} = (14, 1, 13, 1)$
163 : $P_{2811} = (10, 14, 9, 1)$	217 : $P_{3668} = (3, 4, 13, 1)$
164 : $P_{2824} = (7, 15, 9, 1)$	218 : $P_{3674} = (9, 4, 13, 1)$
165 : $P_{2833} = (0, 0, 10, 1)$	219 : $P_{3680} = (15, 4, 13, 1)$
166 : $P_{2834} = (1, 0, 10, 1)$	220 : $P_{3691} = (10, 5, 13, 1)$
167 : $P_{2871} = (6, 2, 10, 1)$	221 : $P_{3711} = (14, 6, 13, 1)$
168 : $P_{2887} = (6, 3, 10, 1)$	222 : $P_{3720} = (7, 7, 13, 1)$
169 : $P_{2890} = (9, 3, 10, 1)$	223 : $P_{3721} = (8, 7, 13, 1)$
170 : $P_{2894} = (13, 3, 10, 1)$	224 : $P_{3722} = (9, 7, 13, 1)$
171 : $P_{2914} = (1, 5, 10, 1)$	225 : $P_{3730} = (1, 8, 13, 1)$

226 :  $P_{3747} = (2, 9, 13, 1)$   
 227 :  $P_{3762} = (1, 10, 13, 1)$   
 228 :  $P_{3775} = (14, 10, 13, 1)$   
 229 :  $P_{3798} = (5, 12, 13, 1)$   
 230 :  $P_{3816} = (7, 13, 13, 1)$   
 231 :  $P_{3834} = (9, 14, 13, 1)$   
 232 :  $P_{3842} = (1, 15, 13, 1)$   
 233 :  $P_{3900} = (11, 2, 14, 1)$   
 234 :  $P_{3917} = (12, 3, 14, 1)$   
 235 :  $P_{3932} = (11, 4, 14, 1)$   
 236 :  $P_{3965} = (12, 6, 14, 1)$   
 237 :  $P_{3976} = (7, 7, 14, 1)$   
 238 :  $P_{3977} = (8, 7, 14, 1)$   
 239 :  $P_{3978} = (9, 7, 14, 1)$   
 240 :  $P_{3996} = (11, 8, 14, 1)$

241 :  $P_{4066} = (1, 13, 14, 1)$   
 242 :  $P_{4088} = (7, 14, 14, 1)$   
 243 :  $P_{4107} = (10, 15, 14, 1)$   
 244 :  $P_{4221} = (12, 6, 15, 1)$   
 245 :  $P_{4249} = (8, 8, 15, 1)$   
 246 :  $P_{4295} = (6, 11, 15, 1)$   
 247 :  $P_{4300} = (11, 11, 15, 1)$   
 248 :  $P_{4315} = (10, 12, 15, 1)$   
 249 :  $P_{4325} = (4, 13, 15, 1)$   
 250 :  $P_{4326} = (5, 13, 15, 1)$   
 251 :  $P_{4334} = (13, 13, 15, 1)$   
 252 :  $P_{4361} = (8, 15, 15, 1)$   
 253 :  $P_{4364} = (11, 15, 15, 1)$   
 254 :  $P_{4366} = (13, 15, 15, 1)$

## 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 : $P_{20} = (1, 0, 1, 0)$	21 : $P_{229} = (2, 13, 1, 0)$	42 : $P_{450} = (0, 11, 0, 1)$
1 : $P_{29} = (10, 0, 1, 0)$	22 : $P_{231} = (4, 13, 1, 0)$	43 : $P_{460} = (10, 11, 0, 1)$
2 : $P_{30} = (11, 0, 1, 0)$	23 : $P_{238} = (11, 13, 1, 0)$	44 : $P_{472} = (6, 12, 0, 1)$
3 : $P_{73} = (6, 3, 1, 0)$	24 : $P_{271} = (12, 15, 1, 0)$	45 : $P_{489} = (7, 13, 0, 1)$
4 : $P_{112} = (13, 5, 1, 0)$	25 : $P_{290} = (0, 1, 0, 1)$	46 : $P_{505} = (7, 14, 0, 1)$
5 : $P_{117} = (2, 6, 1, 0)$	26 : $P_{318} = (12, 2, 0, 1)$	47 : $P_{522} = (8, 15, 0, 1)$
6 : $P_{125} = (10, 6, 1, 0)$	27 : $P_{329} = (7, 3, 0, 1)$	48 : $P_{525} = (11, 15, 0, 1)$
7 : $P_{129} = (14, 6, 1, 0)$	28 : $P_{332} = (10, 3, 0, 1)$	49 : $P_{527} = (13, 15, 0, 1)$
8 : $P_{135} = (4, 7, 1, 0)$	29 : $P_{337} = (15, 3, 0, 1)$	50 : $P_{530} = (0, 0, 1, 1)$
9 : $P_{140} = (9, 7, 1, 0)$	30 : $P_{344} = (6, 4, 0, 1)$	51 : $P_{531} = (1, 0, 1, 1)$
10 : $P_{141} = (10, 7, 1, 0)$	31 : $P_{357} = (3, 5, 0, 1)$	52 : $P_{546} = (0, 1, 1, 1)$
11 : $P_{154} = (7, 8, 1, 0)$	32 : $P_{365} = (11, 5, 0, 1)$	53 : $P_{582} = (5, 3, 1, 1)$
12 : $P_{180} = (1, 10, 1, 0)$	33 : $P_{366} = (12, 5, 0, 1)$	54 : $P_{617} = (8, 5, 1, 1)$
13 : $P_{181} = (2, 10, 1, 0)$	34 : $P_{383} = (13, 6, 0, 1)$	55 : $P_{637} = (12, 6, 1, 1)$
14 : $P_{188} = (9, 10, 1, 0)$	35 : $P_{398} = (12, 7, 0, 1)$	56 : $P_{654} = (13, 7, 1, 1)$
15 : $P_{196} = (1, 11, 1, 0)$	36 : $P_{407} = (5, 8, 0, 1)$	57 : $P_{672} = (15, 8, 1, 1)$
16 : $P_{199} = (4, 11, 1, 0)$	37 : $P_{408} = (6, 8, 0, 1)$	58 : $P_{690} = (1, 10, 1, 1)$
17 : $P_{209} = (14, 11, 1, 0)$	38 : $P_{412} = (10, 8, 0, 1)$	59 : $P_{693} = (4, 10, 1, 1)$
18 : $P_{220} = (9, 12, 1, 0)$	39 : $P_{431} = (13, 9, 0, 1)$	60 : $P_{703} = (14, 10, 1, 1)$
19 : $P_{222} = (11, 12, 1, 0)$	40 : $P_{434} = (0, 10, 0, 1)$	61 : $P_{706} = (1, 11, 1, 1)$
20 : $P_{225} = (14, 12, 1, 0)$	41 : $P_{445} = (11, 10, 0, 1)$	62 : $P_{707} = (2, 11, 1, 1)$

63 : $P_{714} = (9, 11, 1, 1)$	117 : $P_{1760} = (15, 12, 5, 1)$	171 : $P_{2494} = (13, 10, 8, 1)$
64 : $P_{728} = (7, 12, 1, 1)$	118 : $P_{1771} = (10, 13, 5, 1)$	172 : $P_{2501} = (4, 11, 8, 1)$
65 : $P_{743} = (6, 13, 1, 1)$	119 : $P_{1830} = (5, 1, 6, 1)$	173 : $P_{2520} = (7, 12, 8, 1)$
66 : $P_{772} = (3, 15, 1, 1)$	120 : $P_{1834} = (9, 1, 6, 1)$	174 : $P_{2619} = (10, 2, 9, 1)$
67 : $P_{829} = (12, 2, 2, 1)$	121 : $P_{1837} = (12, 1, 6, 1)$	175 : $P_{2667} = (10, 5, 9, 1)$
68 : $P_{844} = (11, 3, 2, 1)$	122 : $P_{1845} = (4, 2, 6, 1)$	176 : $P_{2674} = (1, 6, 9, 1)$
69 : $P_{859} = (10, 4, 2, 1)$	123 : $P_{1849} = (8, 2, 6, 1)$	177 : $P_{2716} = (11, 8, 9, 1)$
70 : $P_{871} = (6, 5, 2, 1)$	124 : $P_{1856} = (15, 2, 6, 1)$	178 : $P_{2734} = (13, 9, 9, 1)$
71 : $P_{898} = (1, 7, 2, 1)$	125 : $P_{1868} = (11, 3, 6, 1)$	179 : $P_{2744} = (7, 10, 9, 1)$
72 : $P_{939} = (10, 9, 2, 1)$	126 : $P_{1887} = (14, 4, 6, 1)$	180 : $P_{2768} = (15, 11, 9, 1)$
73 : $P_{951} = (6, 10, 2, 1)$	127 : $P_{1890} = (1, 5, 6, 1)$	181 : $P_{2776} = (7, 12, 9, 1)$
74 : $P_{966} = (5, 11, 2, 1)$	128 : $P_{1918} = (13, 6, 6, 1)$	182 : $P_{2789} = (4, 13, 9, 1)$
75 : $P_{989} = (12, 12, 2, 1)$	129 : $P_{1924} = (3, 7, 6, 1)$	183 : $P_{2790} = (5, 13, 9, 1)$
76 : $P_{991} = (14, 12, 2, 1)$	130 : $P_{1938} = (1, 8, 6, 1)$	184 : $P_{2798} = (13, 13, 9, 1)$
77 : $P_{992} = (15, 12, 2, 1)$	131 : $P_{1957} = (4, 9, 6, 1)$	185 : $P_{2811} = (10, 14, 9, 1)$
78 : $P_{999} = (6, 13, 2, 1)$	132 : $P_{1974} = (5, 10, 6, 1)$	186 : $P_{2824} = (7, 15, 9, 1)$
79 : $P_{1035} = (10, 15, 2, 1)$	133 : $P_{1986} = (1, 11, 6, 1)$	187 : $P_{2833} = (0, 0, 10, 1)$
80 : $P_{1096} = (7, 3, 3, 1)$	134 : $P_{1987} = (2, 11, 6, 1)$	188 : $P_{2834} = (1, 0, 10, 1)$
81 : $P_{1099} = (10, 3, 3, 1)$	135 : $P_{1994} = (9, 11, 6, 1)$	189 : $P_{2871} = (6, 2, 10, 1)$
82 : $P_{1104} = (15, 3, 3, 1)$	136 : $P_{2010} = (9, 12, 6, 1)$	190 : $P_{2887} = (6, 3, 10, 1)$
83 : $P_{1148} = (11, 6, 3, 1)$	137 : $P_{2021} = (4, 13, 6, 1)$	191 : $P_{2890} = (9, 3, 10, 1)$
84 : $P_{1160} = (7, 7, 3, 1)$	138 : $P_{2022} = (5, 13, 6, 1)$	192 : $P_{2894} = (13, 3, 10, 1)$
85 : $P_{1161} = (8, 7, 3, 1)$	139 : $P_{2030} = (13, 13, 6, 1)$	193 : $P_{2914} = (1, 5, 10, 1)$
86 : $P_{1162} = (9, 7, 3, 1)$	140 : $P_{2083} = (2, 1, 7, 1)$	194 : $P_{2963} = (2, 8, 10, 1)$
87 : $P_{1211} = (10, 10, 3, 1)$	141 : $P_{2094} = (13, 1, 7, 1)$	195 : $P_{2968} = (7, 8, 10, 1)$
88 : $P_{1213} = (12, 10, 3, 1)$	142 : $P_{2096} = (15, 1, 7, 1)$	196 : $P_{2973} = (12, 8, 10, 1)$
89 : $P_{1214} = (13, 10, 3, 1)$	143 : $P_{2111} = (14, 2, 7, 1)$	197 : $P_{2984} = (7, 9, 10, 1)$
90 : $P_{1231} = (14, 11, 3, 1)$	144 : $P_{2114} = (1, 3, 7, 1)$	198 : $P_{2993} = (0, 10, 10, 1)$
91 : $P_{1255} = (6, 13, 3, 1)$	145 : $P_{2169} = (8, 6, 7, 1)$	199 : $P_{3004} = (11, 10, 10, 1)$
92 : $P_{1296} = (15, 15, 3, 1)$	146 : $P_{2189} = (12, 7, 7, 1)$	200 : $P_{3015} = (6, 11, 10, 1)$
93 : $P_{1356} = (11, 3, 4, 1)$	147 : $P_{2204} = (11, 8, 7, 1)$	201 : $P_{3016} = (7, 11, 10, 1)$
94 : $P_{1367} = (6, 4, 4, 1)$	148 : $P_{2212} = (3, 9, 7, 1)$	202 : $P_{3020} = (11, 11, 10, 1)$
95 : $P_{1387} = (10, 5, 4, 1)$	149 : $P_{2214} = (5, 9, 7, 1)$	203 : $P_{3074} = (1, 15, 10, 1)$
96 : $P_{1395} = (2, 6, 4, 1)$	150 : $P_{2223} = (14, 9, 7, 1)$	204 : $P_{3089} = (0, 0, 11, 1)$
97 : $P_{1396} = (3, 6, 4, 1)$	151 : $P_{2240} = (15, 10, 7, 1)$	205 : $P_{3090} = (1, 0, 11, 1)$
98 : $P_{1399} = (6, 6, 4, 1)$	152 : $P_{2242} = (1, 11, 7, 1)$	206 : $P_{3138} = (1, 3, 11, 1)$
99 : $P_{1422} = (13, 7, 4, 1)$	153 : $P_{2243} = (2, 11, 7, 1)$	207 : $P_{3166} = (13, 4, 11, 1)$
100 : $P_{1438} = (13, 8, 4, 1)$	154 : $P_{2250} = (9, 11, 7, 1)$	208 : $P_{3176} = (7, 5, 11, 1)$
101 : $P_{1452} = (11, 9, 4, 1)$	155 : $P_{2269} = (12, 12, 7, 1)$	209 : $P_{3182} = (13, 5, 11, 1)$
102 : $P_{1465} = (8, 10, 4, 1)$	156 : $P_{2271} = (14, 12, 7, 1)$	210 : $P_{3183} = (14, 5, 11, 1)$
103 : $P_{1486} = (13, 11, 4, 1)$	157 : $P_{2272} = (15, 12, 7, 1)$	211 : $P_{3218} = (1, 8, 11, 1)$
104 : $P_{1490} = (1, 12, 4, 1)$	158 : $P_{2275} = (2, 13, 7, 1)$	212 : $P_{3259} = (10, 10, 11, 1)$
105 : $P_{1532} = (11, 14, 4, 1)$	159 : $P_{2293} = (4, 14, 7, 1)$	213 : $P_{3261} = (12, 10, 11, 1)$
106 : $P_{1604} = (3, 3, 5, 1)$	160 : $P_{2306} = (1, 15, 7, 1)$	214 : $P_{3262} = (13, 10, 11, 1)$
107 : $P_{1636} = (3, 5, 5, 1)$	161 : $P_{2406} = (5, 5, 8, 1)$	215 : $P_{3265} = (0, 11, 11, 1)$
108 : $P_{1644} = (11, 5, 5, 1)$	162 : $P_{2419} = (2, 6, 8, 1)$	216 : $P_{3275} = (10, 11, 11, 1)$
109 : $P_{1645} = (12, 5, 5, 1)$	163 : $P_{2420} = (3, 6, 8, 1)$	217 : $P_{3325} = (12, 14, 11, 1)$
110 : $P_{1678} = (13, 7, 5, 1)$	164 : $P_{2423} = (6, 6, 8, 1)$	218 : $P_{3333} = (4, 15, 11, 1)$
111 : $P_{1715} = (2, 10, 5, 1)$	165 : $P_{2444} = (11, 7, 8, 1)$	219 : $P_{3335} = (6, 15, 11, 1)$
112 : $P_{1735} = (6, 11, 5, 1)$	166 : $P_{2454} = (5, 8, 8, 1)$	220 : $P_{3341} = (12, 15, 11, 1)$
113 : $P_{1736} = (7, 11, 5, 1)$	167 : $P_{2455} = (6, 8, 8, 1)$	221 : $P_{3364} = (3, 1, 12, 1)$
114 : $P_{1740} = (11, 11, 5, 1)$	168 : $P_{2459} = (10, 8, 8, 1)$	222 : $P_{3365} = (4, 1, 12, 1)$
115 : $P_{1757} = (12, 12, 5, 1)$	169 : $P_{2491} = (10, 10, 8, 1)$	223 : $P_{3368} = (7, 1, 12, 1)$
116 : $P_{1759} = (14, 12, 5, 1)$	170 : $P_{2493} = (12, 10, 8, 1)$	224 : $P_{3386} = (9, 2, 12, 1)$

225 : $P_{3394} = (1, 3, 12, 1)$	247 : $P_{3680} = (15, 4, 13, 1)$	269 : $P_{3978} = (9, 7, 14, 1)$
226 : $P_{3411} = (2, 4, 12, 1)$	248 : $P_{3691} = (10, 5, 13, 1)$	270 : $P_{3996} = (11, 8, 14, 1)$
227 : $P_{3426} = (1, 5, 12, 1)$	249 : $P_{3711} = (14, 6, 13, 1)$	271 : $P_{4020} = (3, 10, 14, 1)$
228 : $P_{3443} = (2, 6, 12, 1)$	250 : $P_{3720} = (7, 7, 13, 1)$	272 : $P_{4045} = (12, 11, 14, 1)$
229 : $P_{3444} = (3, 6, 12, 1)$	251 : $P_{3721} = (8, 7, 13, 1)$	273 : $P_{4066} = (1, 13, 14, 1)$
230 : $P_{3447} = (6, 6, 12, 1)$	252 : $P_{3722} = (9, 7, 13, 1)$	274 : $P_{4088} = (7, 14, 14, 1)$
231 : $P_{3461} = (4, 7, 12, 1)$	253 : $P_{3730} = (1, 8, 13, 1)$	275 : $P_{4107} = (10, 15, 14, 1)$
232 : $P_{3506} = (1, 10, 12, 1)$	254 : $P_{3747} = (2, 9, 13, 1)$	276 : $P_{4221} = (12, 6, 15, 1)$
233 : $P_{3509} = (4, 10, 12, 1)$	255 : $P_{3762} = (1, 10, 13, 1)$	277 : $P_{4249} = (8, 8, 15, 1)$
234 : $P_{3519} = (14, 10, 12, 1)$	256 : $P_{3765} = (4, 10, 13, 1)$	278 : $P_{4282} = (9, 10, 15, 1)$
235 : $P_{3524} = (3, 11, 12, 1)$	257 : $P_{3775} = (14, 10, 13, 1)$	279 : $P_{4295} = (6, 11, 15, 1)$
236 : $P_{3543} = (6, 12, 12, 1)$	258 : $P_{3785} = (8, 11, 13, 1)$	280 : $P_{4296} = (7, 11, 15, 1)$
237 : $P_{3568} = (15, 13, 12, 1)$	259 : $P_{3798} = (5, 12, 13, 1)$	281 : $P_{4300} = (11, 11, 15, 1)$
238 : $P_{3571} = (2, 14, 12, 1)$	260 : $P_{3816} = (7, 13, 13, 1)$	282 : $P_{4315} = (10, 12, 15, 1)$
239 : $P_{3574} = (5, 14, 12, 1)$	261 : $P_{3834} = (9, 14, 13, 1)$	283 : $P_{4325} = (4, 13, 15, 1)$
240 : $P_{3577} = (8, 14, 12, 1)$	262 : $P_{3842} = (1, 15, 13, 1)$	284 : $P_{4326} = (5, 13, 15, 1)$
241 : $P_{3595} = (10, 15, 12, 1)$	263 : $P_{3900} = (11, 2, 14, 1)$	285 : $P_{4334} = (13, 13, 15, 1)$
242 : $P_{3623} = (6, 1, 13, 1)$	264 : $P_{3917} = (12, 3, 14, 1)$	286 : $P_{4361} = (8, 15, 15, 1)$
243 : $P_{3625} = (8, 1, 13, 1)$	265 : $P_{3932} = (11, 4, 14, 1)$	287 : $P_{4364} = (11, 15, 15, 1)$
244 : $P_{3631} = (14, 1, 13, 1)$	266 : $P_{3965} = (12, 6, 14, 1)$	288 : $P_{4366} = (13, 15, 15, 1)$
245 : $P_{3668} = (3, 4, 13, 1)$	267 : $P_{3976} = (7, 7, 14, 1)$	
246 : $P_{3674} = (9, 4, 13, 1)$	268 : $P_{3977} = (8, 7, 14, 1)$	