Rank-65743 over GF(16)

January 15, 2021

The equation

The equation of the surface is :

$$X_2^3 + X_3^3 + X_0^2X_3 + X_0X_1^2 + X_0X_1X_2 = 0$$

(0, 0, 1, 1, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(16) is 571548181

General information

Number of lines	21
Number of points	353
Number of singular points	1
Number of Eckardt points	1
Number of double points	72
Number of single points	204
Number of points off lines	75
Number of Hesse planes	0
Number of axes	0
Type of points on lines	17^{21}
Type of lines on points	6, 3, 2^{72}, 1^{204}, 0^{75}

Singular Points

The surface has 1 singular points:

$0: \ P_{275} = \mathbf{P}(1,0,0,1) = \mathbf{P}(1,0,0,1)$

The 21 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{69889} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{69889} = \mathbf{Pl}(0,0,0,1,0,1)_{5121}$$

$$\ell_1 = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \delta^5 \end{array}\right]_{69899} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 11 \end{array}\right]_{69899} = \mathbf{Pl}(0,0,0,11,0,1)_{5431}$$

$$\ell_2 = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \delta^{10} \end{array}\right]_{69898} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 10 \end{array}\right]_{69898} = \mathbf{Pl}(0,0,0,10,0,1)_{5400}$$

$$\ell_3 = \left[\begin{array}{cccc} 1 & 0 & \delta & \delta^7 \\ 0 & 1 & \delta^3 & \delta^8 \end{array}\right]_{31354} = \left[\begin{array}{cccc} 1 & 0 & 2 & 7 \\ 0 & 1 & 8 & 14 \end{array}\right]_{31354} = \mathbf{Pl}(10,11,5,15,7,1)_{35220}$$

$$\ell_4 = \left[\begin{array}{cccc} 1 & 0 & \delta^{12} & \delta^{14} \\ 0 & 1 & \delta^{14} & \delta^4 \end{array}\right]_{53391} = \left[\begin{array}{cccc} 1 & 0 & 3 & 12 \\ 0 & 1 & 12 & 9 \end{array}\right]_{53391} = \mathbf{Pl}(10,11,6,4,7,1)_{35445}$$

$$\ell_5 = \left[\begin{array}{cccc} 1 & 0 & \delta^2 & \delta^{14} \\ 0 & 1 & \delta^6 & \delta \end{array}\right]_{53555} = \left[\begin{array}{cccc} 1 & 0 & 4 & 12 \\ 0 & 1 & 15 & 2 \end{array}\right]_{53555} = \mathbf{Pl}(11,10,8,3,12,1)_{56281}$$

$$\ell_6 = \left[\begin{array}{cccc} 1 & 0 & \delta^9 & \delta^{13} \\ 0 & 1 & \delta^{13} & \delta^8 \end{array}\right]_{27803} = \left[\begin{array}{cccc} 1 & 0 & 5 & 6 \\ 0 & 1 & 6 & 14 \end{array}\right]_{27803} = \mathbf{Pl}(11,10,13,9,12,1)_{57346}$$

$$\ell_7 = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & \delta^2 & \delta^{12} \end{array}\right]_{4420} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & 4 & 3 \end{array}\right]_{4420} = \mathbf{Pl}(10,11,11,8,1,0)_{2984}$$

$$\ell_8 = \left[\begin{array}{cccc} 1 & 0 & \delta^{13} & \delta^{11} \\ 0 & 1 & \delta^8 & \delta^8 \end{array}\right]_{58660} = \left[\begin{array}{cccc} 1 & 0 & 6 & 13 \\ 0 & 1 & 14 & 14 \end{array}\right]_{58660} = \mathbf{Pl}(1,1,4,6,10,1)_{47301}$$

$$\ell_9 = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & \delta^8 & \delta^3 \end{array}\right]_{4510} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & 14 & 8 \end{array}\right]_{4510} = \mathbf{Pl}(10,11,11,3,1,0)_{1859}$$

$$\ell_{10} = \left[\begin{array}{cccc} 1 & 0 & \delta^7 & \delta^{14} \\ 0 & 1 & \delta^2 & \delta^2 \end{array}\right]_{54395} = \left[\begin{array}{cccc} 1 & 0 & 7 & 12 \\ 0 & 1 & 4 & 4 \end{array}\right]_{54395} = \mathbf{Pl}(1,1,14,7,10,1)_{49416}$$

$$\ell_{11} = \left[\begin{array}{cccc} 1 & 0 & \delta^3 & \delta^{11} \\ 0 & 1 & \delta^{11} & \delta \end{array}\right]_{59013} = \left[\begin{array}{cccc} 1 & 0 & 8 & 13 \\ 0 & 1 & 13 & 2 \end{array}\right]_{59013} = \mathbf{Pl}(10,11,7,14,6,1)_{31650}$$

$$\ell_{12} = \left[\begin{array}{cccc} 1 & 0 & \delta^4 & \delta^{13} \\ 0 & 1 & \delta^{12} & \delta^2 \end{array}\right]_{28732} = \left[\begin{array}{cccc} 1 & 0 & 9 & 6 \\ 0 & 1 & 3 & 4 \end{array}\right]_{28732} = \mathbf{Pl}(10,11,15,5,6,1)_{33345}$$

$$\ell_{13} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & \delta^5 & \delta^5 \end{array}\right]_{4555} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & 11 & 11 \end{array}\right]_{4555} = \mathbf{Pl}(1,1,1,10,1,0)_{3275}$$

$$\ell_{14} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & \delta^{10} & \delta^{10} \end{array}\right]_{4538} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & 10 & 10 \end{array}\right]_{4538} = \mathbf{Pl}(1,1,1,11,1,0)_{3500}$$

$$\ell_{15} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & \delta & \delta^6 \end{array}\right]_{4610} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & 2 & 15 \end{array}\right]_{4610} = \mathbf{Pl}(11,10,10,5,1,0)_{2295}$$

$$\ell_{16} = \left[\begin{array}{cccc} 1 & 0 & \delta^{14} & \delta^{13} \\ 0 & 1 & \delta^4 & \delta^4 \end{array}\right]_{29637} = \left[\begin{array}{cccc} 1 & 0 & 12 & 6 \\ 0 & 1 & 9 & 9 \end{array}\right]_{29637} = \mathbf{Pl}(1,1,2,12,11,1)_{51051}$$

$$\ell_{17} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & \delta^4 & \delta^9 \end{array}\right]_{4457} = \left[\begin{array}{cccc} 1 & 0 & 0 & 1 \\ 0 & 1 & 9 & 5 \end{array}\right]_{4457} = \mathbf{Pl}(11,10,10,15,1,0)_{4545}$$

$$\ell_{18} = \left[\begin{array}{cccc} 1 & 0 & \delta^{11} & \delta^7 \\ 0 & 1 & \delta & \delta \end{array}\right]_{34159} = \left[\begin{array}{cccc} 1 & 0 & 13 & 7 \\ 0 & 1 & 2 & 2 \end{array}\right]_{34159} = \mathbf{Pl}(1,1,9,13,11,1)_{52536}$$

$$\ell_{19} = \left[\begin{array}{cccc} 1 & 0 & \delta^8 & \delta^{11} \\ 0 & 1 & \delta^9 & \delta^4 \end{array}\right]_{60755} = \left[\begin{array}{cccc} 1 & 0 & 14 & 13 \\ 0 & 1 & 5 & 9 \end{array}\right]_{60755} = \mathbf{Pl}(11,10,3,8,13,1)_{59461}$$

$$\ell_{20} = \left[\begin{array}{cccc} 1 & 0 & \delta^6 & \delta^7 \\ 0 & 1 & \delta^7 & \delta^2 \end{array}\right]_{34742} = \left[\begin{array}{cccc} 1 & 0 & 15 & 7 \\ 0 & 1 & 7 & 4 \end{array}\right]_{34742} = \mathbf{Pl}(11,10,12,2,13,1)_{61366}$$

Rank of lines: (69889, 69899, 69898, 31354, 53391, 53555, 27803, 4420, 58660, 4510, 54395, 59013, 28732, 4555, 4538, 4610, 29637, 4457, 34159, 60755, 34742)

Rank of points on Klein quadric: (5121, 5431, 5400, 35220, 35445, 56281, 57346, 2984, 47301, 1859, 49416, 31650, 33345, 3275, 3500, 2295, 51051, 4545, 52536, 59461, 61366)

Eckardt Points

The surface has 1 Eckardt points:
$0 : P_1 = \mathbf{P}(0,1,0,0) = \mathbf{P}(0,1,0,0)$.

Double Points

The surface has 72 Double points:
The double points on the surface are:

$P_{641} = (0,7,1,1) = \ell_0 \cap \ell_8$
$P_{625} = (0,6,1,1) = \ell_0 \cap \ell_{10}$
$P_{689} = (0,10,1,1) = \ell_0 \cap \ell_{13}$
$P_{705} = (0,11,1,1) = \ell_0 \cap \ell_{14}$
$P_{737} = (0,13,1,1) = \ell_0 \cap \ell_{16}$
$P_{721} = (0,12,1,1) = \ell_0 \cap \ell_{18}$
$P_{2945} = (0,7,10,1) = \ell_1 \cap \ell_3$
$P_{3041} = (0,13,10,1) = \ell_1 \cap \ell_4$
$P_{3025} = (0,12,10,1) = \ell_1 \cap \ell_{11}$
$P_{2929} = (0,6,10,1) = \ell_1 \cap \ell_{12}$
$P_{2913} = (0,5,10,1) = \ell_1 \cap \ell_{15}$
$P_{3073} = (0,15,10,1) = \ell_1 \cap \ell_{17}$
$P_{3281} = (0,12,11,1) = \ell_2 \cap \ell_5$
$P_{3201} = (0,7,11,1) = \ell_2 \cap \ell_6$
$P_{3217} = (0,8,11,1) = \ell_2 \cap \ell_7$
$P_{3137} = (0,3,11,1) = \ell_2 \cap \ell_9$
$P_{3297} = (0,13,11,1) = \ell_2 \cap \ell_{19}$
$P_{3185} = (0,6,11,1) = \ell_2 \cap \ell_{20}$
$P_{437} = (3,10,0,1) = \ell_3 \cap \ell_4$
$P_{1339} = (10,2,4,1) = \ell_3 \cap \ell_5$
$P_{4106} = (9,15,14,1) = \ell_3 \cap \ell_7$
$P_{3750} = (5,9,13,1) = \ell_3 \cap \ell_{10}$
$P_{2135} = (6,4,7,1) = \ell_3 \cap \ell_{13}$
$P_{1248} = (15,12,3,1) = \ell_3 \cap \ell_{16}$
$P_{1020} = (11,14,2,1) = \ell_3 \cap \ell_{19}$
$P_{1403} = (10,6,4,1) = \ell_4 \cap \ell_6$
$P_{3670} = (5,4,13,1) = \ell_4 \cap \ell_8$
$P_{3882} = (9,1,14,1) = \ell_4 \cap \ell_9$
$P_{2119} = (6,3,7,1) = \ell_4 \cap \ell_{14}$
$P_{1296} = (15,15,3,1) = \ell_4 \cap \ell_{18}$
$P_{988} = (11,12,2,1) = \ell_4 \cap \ell_{20}$
$P_{455} = (5,11,0,1) = \ell_5 \cap \ell_6$
$P_{1652} = (3,6,5,1) = \ell_5 \cap \ell_8$
$P_{2652} = (11,4,9,1) = \ell_5 \cap \ell_{12}$
$P_{3502} = (13,9,12,1) = \ell_5 \cap \ell_{14}$
$P_{2297} = (8,14,7,1) = \ell_5 \cap \ell_{16}$
$P_{847} = (14,3,2,1) = \ell_5 \cap \ell_{17}$
$P_{1604} = (3,3,5,1) = \ell_6 \cap \ell_{10}$
$P_{2796} = (11,13,9,1) = \ell_6 \cap \ell_{11}$
$P_{3438} = (13,5,12,1) = \ell_6 \cap \ell_{13}$
$P_{815} = (14,1,2,1) = \ell_6 \cap \ell_{15}$
$P_{2217} = (8,9,7,1) = \ell_6 \cap \ell_{18}$
$P_{125} = (10,6,1,0) = \ell_7 \cap \ell_8$
$P_{1315} = (2,1,4,1) = \ell_7 \cap \ell_{11}$
$P_{3067} = (10,14,10,1) = \ell_7 \cap \ell_{18}$
$P_{300} = (10,1,0,1) = \ell_8 \cap \ell_{10}$
$P_{3392} = (15,2,12,1) = \ell_8 \cap \ell_{12}$
$P_{3244} = (11,9,11,1) = \ell_8 \cap \ell_{15}$
$P_{4249} = (8,8,15,1) = \ell_8 \cap \ell_{20}$
$P_{141} = (10,7,1,0) = \ell_9 \cap \ell_{10}$
$P_{1379} = (2,5,4,1) = \ell_9 \cap \ell_{12}$
$P_{2907} = (10,4,10,1) = \ell_9 \cap \ell_{16}$
$P_{3584} = (15,14,12,1) = \ell_{10} \cap \ell_{11}$
$P_{3132} = (11,2,11,1) = \ell_{10} \cap \ell_{17}$
$P_{4233} = (8,7,15,1) = \ell_{10} \cap \ell_{19}$
$P_{442} = (8,10,0,1) = \ell_{11} \cap \ell_{12}$
$P_{1944} = (7,8,6,1) = \ell_{11} \cap \ell_{14}$
$P_{2406} = (5,5,8,1) = \ell_{11} \cap \ell_{16}$
$P_{3979} = (10,7,14,1) = \ell_{11} \cap \ell_{20}$
$P_{2040} = (7,14,6,1) = \ell_{12} \cap \ell_{13}$
$P_{2534} = (5,13,8,1) = \ell_{12} \cap \ell_{18}$
$P_{4011} = (10,9,14,1) = \ell_{12} \cap \ell_{19}$
$P_{3853} = (12,15,13,1) = \ell_{13} \cap \ell_{20}$
$P_{3645} = (12,2,13,1) = \ell_{14} \cap \ell_{19}$
$P_{222} = (11,12,1,0) = \ell_{15} \cap \ell_{16}$
$P_{2709} = (4,8,9,1) = \ell_{15} \cap \ell_{19}$
$P_{301} = (11,1,0,1) = \ell_{16} \cap \ell_{18}$
$P_{1844} = (3,2,6,1) = \ell_{16} \cap \ell_{20}$
$P_{238} = (11,13,1,0) = \ell_{17} \cap \ell_{18}$
$P_{2597} = (4,1,9,1) = \ell_{17} \cap \ell_{20}$
$P_{1876} = (3,4,6,1) = \ell_{18} \cap \ell_{19}$
$P_{465} = (15,11,0,1) = \ell_{19} \cap \ell_{20}$

Single Points

The surface has 204 single points:
The single points on the surface are:

0 : $P_{55} = (4, 2, 1, 0)$ lies on line ℓ_3
1 : $P_{71} = (4, 3, 1, 0)$ lies on line ℓ_4
2 : $P_{92} = (9, 4, 1, 0)$ lies on line ℓ_5
3 : $P_{108} = (9, 5, 1, 0)$ lies on line ℓ_6
4 : $P_{161} = (14, 8, 1, 0)$ lies on line ℓ_{11}
5 : $P_{177} = (14, 9, 1, 0)$ lies on line ℓ_{12}
6 : $P_{180} = (1, 10, 1, 0)$ lies on line ℓ_{13}
7 : $P_{196} = (1, 11, 1, 0)$ lies on line ℓ_{14}
8 : $P_{245} = (2, 14, 1, 0)$ lies on line ℓ_{19}
9 : $P_{261} = (2, 15, 1, 0)$ lies on line ℓ_{20}
10 : $P_{530} = (0, 0, 1, 1)$ lies on line ℓ_0
11 : $P_{546} = (0, 1, 1, 1)$ lies on line ℓ_0
12 : $P_{561} = (0, 2, 1, 1)$ lies on line ℓ_0
13 : $P_{567} = (6, 2, 1, 1)$ lies on line ℓ_{11}
14 : $P_{577} = (0, 3, 1, 1)$ lies on line ℓ_0
15 : $P_{583} = (6, 3, 1, 1)$ lies on line ℓ_{12}
16 : $P_{593} = (0, 4, 1, 1)$ lies on line ℓ_0
17 : $P_{606} = (13, 4, 1, 1)$ lies on line ℓ_{20}
18 : $P_{609} = (0, 5, 1, 1)$ lies on line ℓ_0
19 : $P_{622} = (13, 5, 1, 1)$ lies on line ℓ_{19}
20 : $P_{636} = (11, 6, 1, 1)$ lies on line ℓ_7
21 : $P_{652} = (11, 7, 1, 1)$ lies on line ℓ_9
22 : $P_{657} = (0, 8, 1, 1)$ lies on line ℓ_0
23 : $P_{664} = (7, 8, 1, 1)$ lies on line ℓ_3
24 : $P_{673} = (0, 9, 1, 1)$ lies on line ℓ_0
25 : $P_{680} = (7, 9, 1, 1)$ lies on line ℓ_4
26 : $P_{731} = (10, 12, 1, 1)$ lies on line ℓ_{15}
27 : $P_{747} = (10, 13, 1, 1)$ lies on line ℓ_{17}
28 : $P_{753} = (0, 14, 1, 1)$ lies on line ℓ_0
29 : $P_{765} = (12, 14, 1, 1)$ lies on line ℓ_6
30 : $P_{769} = (0, 15, 1, 1)$ lies on line ℓ_0
31 : $P_{781} = (12, 15, 1, 1)$ lies on line ℓ_5
32 : $P_{789} = (4, 0, 2, 1)$ lies on line ℓ_{16}
33 : $P_{814} = (13, 1, 2, 1)$ lies on line ℓ_{12}
34 : $P_{821} = (4, 2, 2, 1)$ lies on line ℓ_{18}
35 : $P_{846} = (13, 3, 2, 1)$ lies on line ℓ_{11}
36 : $P_{989} = (12, 12, 2, 1)$ lies on line ℓ_7
37 : $P_{996} = (3, 13, 2, 1)$ lies on line ℓ_{13}
38 : $P_{1000} = (7, 13, 2, 1)$ lies on line ℓ_8
39 : $P_{1021} = (12, 14, 2, 1)$ lies on line ℓ_9
40 : $P_{1028} = (3, 15, 2, 1)$ lies on line ℓ_{14}
41 : $P_{1032} = (7, 15, 2, 1)$ lies on line ℓ_{10}
42 : $P_{1050} = (9, 0, 3, 1)$ lies on line ℓ_{19}
43 : $P_{1098} = (9, 3, 3, 1)$ lies on line ℓ_{20}
44 : $P_{1107} = (2, 4, 3, 1)$ lies on line ℓ_{14}
45 : $P_{1112} = (7, 4, 3, 1)$ lies on line ℓ_6
46 : $P_{1155} = (2, 7, 3, 1)$ lies on line ℓ_{13}
47 : $P_{1160} = (7, 7, 3, 1)$ lies on line ℓ_5
48 : $P_{1172} = (3, 8, 3, 1)$ lies on line ℓ_{12}
49 : $P_{1182} = (13, 8, 3, 1)$ lies on line ℓ_{10}
50 : $P_{1191} = (6, 9, 3, 1)$ lies on line ℓ_9
51 : $P_{1207} = (6, 10, 3, 1)$ lies on line ℓ_7
52 : $P_{1220} = (3, 11, 3, 1)$ lies on line ℓ_{11}
53 : $P_{1230} = (13, 11, 3, 1)$ lies on line ℓ_8
54 : $P_{1254} = (5, 13, 3, 1)$ lies on line ℓ_{15}
55 : $P_{1270} = (5, 14, 3, 1)$ lies on line ℓ_{17}
56 : $P_{1306} = (9, 0, 4, 1)$ lies on line ℓ_8
57 : $P_{1320} = (7, 1, 4, 1)$ lies on line ℓ_{19}
58 : $P_{1335} = (6, 2, 4, 1)$ lies on line ℓ_{15}
59 : $P_{1350} = (5, 3, 4, 1)$ lies on line ℓ_{13}
60 : $P_{1357} = (12, 3, 4, 1)$ lies on line ℓ_{16}
61 : $P_{1370} = (9, 4, 4, 1)$ lies on line ℓ_{10}
62 : $P_{1384} = (7, 5, 4, 1)$ lies on line ℓ_{20}
63 : $P_{1399} = (6, 6, 4, 1)$ lies on line ℓ_{17}
64 : $P_{1414} = (5, 7, 4, 1)$ lies on line ℓ_{14}
65 : $P_{1421} = (12, 7, 4, 1)$ lies on line ℓ_{18}
66 : $P_{1567} = (14, 0, 5, 1)$ lies on line ℓ_3
67 : $P_{1593} = (8, 2, 5, 1)$ lies on line ℓ_9
68 : $P_{1647} = (14, 5, 5, 1)$ lies on line ℓ_4
69 : $P_{1673} = (8, 7, 5, 1)$ lies on line ℓ_7
70 : $P_{1701} = (4, 9, 5, 1)$ lies on line ℓ_{13}
71 : $P_{1709} = (12, 9, 5, 1)$ lies on line ℓ_{11}
72 : $P_{1718} = (5, 10, 5, 1)$ lies on line ℓ_{20}
73 : $P_{1720} = (7, 10, 5, 1)$ lies on line ℓ_{18}
74 : $P_{1742} = (13, 11, 5, 1)$ lies on line ℓ_{17}
75 : $P_{1749} = (4, 12, 5, 1)$ lies on line ℓ_{14}
76 : $P_{1757} = (12, 12, 5, 1)$ lies on line ℓ_{12}
77 : $P_{1790} = (13, 14, 5, 1)$ lies on line ℓ_{15}
78 : $P_{1798} = (5, 15, 5, 1)$ lies on line ℓ_{19}
79 : $P_{1800} = (7, 15, 5, 1)$ lies on line ℓ_{16}
80 : $P_{1811} = (2, 0, 6, 1)$ lies on line ℓ_4
81 : $P_{1866} = (9, 3, 6, 1)$ lies on line ℓ_{15}
82 : $P_{1898} = (9, 5, 6, 1)$ lies on line ℓ_{17}
83 : $P_{1907} = (2, 6, 6, 1)$ lies on line ℓ_3
84 : $P_{1970} = (1, 10, 6, 1)$ lies on line ℓ_5
85 : $P_{1973} = (4, 10, 6, 1)$ lies on line ℓ_{10}
86 : $P_{2000} = (15, 11, 6, 1)$ lies on line ℓ_9
87 : $P_{2002} = (1, 12, 6, 1)$ lies on line ℓ_6
88 : $P_{2005} = (4, 12, 6, 1)$ lies on line ℓ_8
89 : $P_{2032} = (15, 13, 6, 1)$ lies on line ℓ_7
90 : $P_{2074} = (9, 0, 7, 1)$ lies on line ℓ_{11}
91 : $P_{2186} = (9, 7, 7, 1)$ lies on line ℓ_{12}
92 : $P_{2195} = (2, 8, 7, 1)$ lies on line ℓ_{17}
93 : $P_{2226} = (1, 10, 7, 1)$ lies on line ℓ_{19}
94 : $P_{2239} = (14, 10, 7, 1)$ lies on line ℓ_8
95 : $P_{2246} = (5, 11, 7, 1)$ lies on line ℓ_7
96 : $P_{2262} = (5, 12, 7, 1)$ lies on line ℓ_9
97 : $P_{2274} = (1, 13, 7, 1)$ lies on line ℓ_{20}
98 : $P_{2287} = (14, 13, 7, 1)$ lies on line ℓ_{10}
99 : $P_{2307} = (2, 15, 7, 1)$ lies on line ℓ_{15}
100 : $P_{2323} = (2, 0, 8, 1)$ lies on line ℓ_5
101 : $P_{2360} = (7, 2, 8, 1)$ lies on line ℓ_7
102 : $P_{2377} = (8, 3, 8, 1)$ lies on line ℓ_3
103 : $P_{2381} = (12, 3, 8, 1)$ lies on line ℓ_8
104 : $P_{2400} = (15, 4, 8, 1)$ lies on line ℓ_{15}
105 : $P_{2423} = (6, 6, 8, 1)$ lies on line ℓ_{19}
106 : $P_{2426} = (9, 6, 8, 1)$ lies on line ℓ_{13}
107 : $P_{2451} = (2, 8, 8, 1)$ lies on line ℓ_6

108 : $P_{2488} = (7, 10, 8, 1)$ lies on line ℓ_9
109 : $P_{2505} = (8, 11, 8, 1)$ lies on line ℓ_4
110 : $P_{2509} = (12, 11, 8, 1)$ lies on line ℓ_{10}
111 : $P_{2528} = (15, 12, 8, 1)$ lies on line ℓ_{17}
112 : $P_{2551} = (6, 14, 8, 1)$ lies on line ℓ_{20}
113 : $P_{2554} = (9, 14, 8, 1)$ lies on line ℓ_{14}
114 : $P_{2591} = (14, 0, 9, 1)$ lies on line ℓ_{18}
115 : $P_{2605} = (12, 1, 9, 1)$ lies on line ℓ_3
116 : $P_{2654} = (13, 4, 9, 1)$ lies on line ℓ_7
117 : $P_{2663} = (6, 5, 9, 1)$ lies on line ℓ_8
118 : $P_{2665} = (8, 5, 9, 1)$ lies on line ℓ_{14}
119 : $P_{2717} = (12, 8, 9, 1)$ lies on line ℓ_4
120 : $P_{2735} = (14, 9, 9, 1)$ lies on line ℓ_{16}
121 : $P_{2775} = (6, 12, 9, 1)$ lies on line ℓ_{10}
122 : $P_{2777} = (8, 12, 9, 1)$ lies on line ℓ_{13}
123 : $P_{2798} = (13, 13, 9, 1)$ lies on line ℓ_9
124 : $P_{2833} = (0, 0, 10, 1)$ lies on line ℓ_1
125 : $P_{2849} = (0, 1, 10, 1)$ lies on line ℓ_1
126 : $P_{2860} = (11, 1, 10, 1)$ lies on line ℓ_{14}
127 : $P_{2865} = (0, 2, 10, 1)$ lies on line ℓ_1
128 : $P_{2874} = (9, 2, 10, 1)$ lies on line ℓ_6
129 : $P_{2881} = (0, 3, 10, 1)$ lies on line ℓ_1
130 : $P_{2883} = (2, 3, 10, 1)$ lies on line ℓ_{19}
131 : $P_{2897} = (0, 4, 10, 1)$ lies on line ℓ_1
132 : $P_{2914} = (1, 5, 10, 1)$ lies on line ℓ_{10}
133 : $P_{2961} = (0, 8, 10, 1)$ lies on line ℓ_1
134 : $P_{2970} = (9, 8, 10, 1)$ lies on line ℓ_5
135 : $P_{2977} = (0, 9, 10, 1)$ lies on line ℓ_1
136 : $P_{2979} = (2, 9, 10, 1)$ lies on line ℓ_{20}
137 : $P_{2993} = (0, 10, 10, 1)$ lies on line ℓ_1
138 : $P_{3009} = (0, 11, 10, 1)$ lies on line ℓ_1
139 : $P_{3020} = (11, 11, 10, 1)$ lies on line ℓ_{13}
140 : $P_{3057} = (0, 14, 10, 1)$ lies on line ℓ_1
141 : $P_{3074} = (1, 15, 10, 1)$ lies on line ℓ_8
142 : $P_{3089} = (0, 0, 11, 1)$ lies on line ℓ_2
143 : $P_{3105} = (0, 1, 11, 1)$ lies on line ℓ_2
144 : $P_{3115} = (10, 1, 11, 1)$ lies on line ℓ_{13}
145 : $P_{3121} = (0, 2, 11, 1)$ lies on line ℓ_2
146 : $P_{3138} = (1, 3, 11, 1)$ lies on line ℓ_{18}
147 : $P_{3153} = (0, 4, 11, 1)$ lies on line ℓ_2
148 : $P_{3167} = (14, 4, 11, 1)$ lies on line ℓ_{11}
149 : $P_{3169} = (0, 5, 11, 1)$ lies on line ℓ_2
150 : $P_{3173} = (4, 5, 11, 1)$ lies on line ℓ_3
151 : $P_{3218} = (1, 8, 11, 1)$ lies on line ℓ_{16}
152 : $P_{3233} = (0, 9, 11, 1)$ lies on line ℓ_2
153 : $P_{3249} = (0, 10, 11, 1)$ lies on line ℓ_2
154 : $P_{3259} = (10, 10, 11, 1)$ lies on line ℓ_{14}
155 : $P_{3265} = (0, 11, 11, 1)$ lies on line ℓ_2
156 : $P_{3313} = (0, 14, 11, 1)$ lies on line ℓ_2
157 : $P_{3317} = (4, 14, 11, 1)$ lies on line ℓ_4
158 : $P_{3329} = (0, 15, 11, 1)$ lies on line ℓ_2
159 : $P_{3343} = (14, 15, 11, 1)$ lies on line ℓ_{12}
160 : $P_{3359} = (14, 0, 12, 1)$ lies on line ℓ_{20}
161 : $P_{3397} = (4, 3, 12, 1)$ lies on line ℓ_7
162 : $P_{3449} = (8, 6, 12, 1)$ lies on line ℓ_{15}
163 : $P_{3458} = (1, 7, 12, 1)$ lies on line ℓ_4
164 : $P_{3459} = (2, 7, 12, 1)$ lies on line ℓ_{16}
165 : $P_{3513} = (8, 10, 12, 1)$ lies on line ℓ_{17}
166 : $P_{3522} = (1, 11, 12, 1)$ lies on line ℓ_3
167 : $P_{3523} = (2, 11, 12, 1)$ lies on line ℓ_{18}
168 : $P_{3551} = (14, 12, 12, 1)$ lies on line ℓ_{19}
169 : $P_{3589} = (4, 15, 12, 1)$ lies on line ℓ_9
170 : $P_{3605} = (4, 0, 13, 1)$ lies on line ℓ_6
171 : $P_{3695} = (14, 5, 13, 1)$ lies on line ℓ_7
172 : $P_{3698} = (1, 6, 13, 1)$ lies on line ℓ_{11}
173 : $P_{3706} = (9, 6, 13, 1)$ lies on line ℓ_{18}
174 : $P_{3716} = (3, 7, 13, 1)$ lies on line ℓ_{17}
175 : $P_{3743} = (14, 8, 13, 1)$ lies on line ℓ_9
176 : $P_{3764} = (3, 10, 13, 1)$ lies on line ℓ_{15}
177 : $P_{3778} = (1, 11, 13, 1)$ lies on line ℓ_{12}
178 : $P_{3786} = (9, 11, 13, 1)$ lies on line ℓ_{16}
179 : $P_{3813} = (4, 13, 13, 1)$ lies on line ℓ_5
180 : $P_{3859} = (2, 0, 14, 1)$ lies on line ℓ_{10}
181 : $P_{3879} = (6, 1, 14, 1)$ lies on line ℓ_5
182 : $P_{3966} = (13, 6, 14, 1)$ lies on line ℓ_{16}
183 : $P_{3968} = (15, 6, 14, 1)$ lies on line ℓ_{14}
184 : $P_{3976} = (7, 7, 14, 1)$ lies on line ℓ_{15}
185 : $P_{3998} = (13, 8, 14, 1)$ lies on line ℓ_{18}
186 : $P_{4000} = (15, 8, 14, 1)$ lies on line ℓ_{13}
187 : $P_{4008} = (7, 9, 14, 1)$ lies on line ℓ_{17}
188 : $P_{4083} = (2, 14, 14, 1)$ lies on line ℓ_8
189 : $P_{4103} = (6, 15, 14, 1)$ lies on line ℓ_6
190 : $P_{4117} = (4, 0, 15, 1)$ lies on line ℓ_{12}
191 : $P_{4158} = (13, 2, 15, 1)$ lies on line ℓ_4
192 : $P_{4159} = (14, 2, 15, 1)$ lies on line ℓ_{13}
193 : $P_{4189} = (12, 4, 15, 1)$ lies on line ℓ_{17}
194 : $P_{4199} = (6, 5, 15, 1)$ lies on line ℓ_{18}
195 : $P_{4208} = (15, 5, 15, 1)$ lies on line ℓ_5
196 : $P_{4212} = (3, 6, 15, 1)$ lies on line ℓ_9
197 : $P_{4260} = (3, 9, 15, 1)$ lies on line ℓ_7
198 : $P_{4279} = (6, 10, 15, 1)$ lies on line ℓ_{16}
199 : $P_{4288} = (15, 10, 15, 1)$ lies on line ℓ_6
200 : $P_{4301} = (12, 11, 15, 1)$ lies on line ℓ_{15}
201 : $P_{4334} = (13, 13, 15, 1)$ lies on line ℓ_3
202 : $P_{4335} = (14, 13, 15, 1)$ lies on line ℓ_{14}
203 : $P_{4357} = (4, 15, 15, 1)$ lies on line ℓ_{11}

The single points on the surface are:

Points on surface but on no line

The surface has 75 points not on any line:
The points on the surface but not on lines are:

$0: P_0 = (1,0,0,0)$
$1: P_{315} = (9,2,0,1)$
$2: P_{319} = (13,2,0,1)$
$3: P_{345} = (7,4,0,1)$
$4: P_{352} = (14,4,0,1)$
$5: P_{420} = (2,9,0,1)$
$6: P_{430} = (12,9,0,1)$
$7: P_{502} = (4,14,0,1)$
$8: P_{504} = (6,14,0,1)$
$9: P_{690} = (1,10,1,1)$
$10: P_{706} = (1,11,1,1)$
$11: P_{1195} = (10,9,3,1)$
$12: P_{1211} = (10,10,3,1)$
$13: P_{1237} = (4,12,3,1)$
$14: P_{1261} = (12,13,3,1)$
$15: P_{1277} = (12,14,3,1)$
$16: P_{1285} = (4,15,3,1)$
$17: P_{1591} = (6,2,5,1)$
$18: P_{1610} = (9,3,5,1)$
$19: P_{1658} = (9,6,5,1)$
$20: P_{1671} = (6,7,5,1)$
$21: P_{1740} = (11,11,5,1)$
$22: P_{1788} = (11,14,5,1)$
$23: P_{1852} = (11,2,6,1)$
$24: P_{1863} = (6,3,6,1)$
$25: P_{1884} = (11,4,6,1)$
$26: P_{1895} = (6,5,6,1)$
$27: P_{1947} = (10,8,6,1)$
$28: P_{1998} = (13,11,6,1)$
$29: P_{2030} = (13,13,6,1)$
$30: P_{2043} = (10,14,6,1)$
$31: P_{2123} = (10,3,7,1)$
$32: P_{2139} = (10,4,7,1)$
$33: P_{2200} = (7,8,7,1)$
$34: P_{2220} = (11,9,7,1)$
$35: P_{2253} = (12,11,7,1)$
$36: P_{2269} = (12,12,7,1)$
$37: P_{2300} = (11,14,7,1)$
$38: P_{2312} = (7,15,7,1)$
$39: P_{2363} = (10,2,8,1)$
$40: P_{2398} = (13,4,8,1)$
$41: P_{2415} = (14,5,8,1)$
$42: P_{2491} = (10,10,8,1)$
$43: P_{2526} = (13,12,8,1)$
$44: P_{2543} = (14,13,8,1)$
$45: P_{2932} = (3,6,10,1)$
$46: P_{2953} = (8,7,10,1)$
$47: P_{3028} = (3,12,10,1)$
$48: P_{3049} = (8,13,10,1)$
$49: P_{3190} = (5,6,11,1)$
$50: P_{3216} = (15,7,11,1)$
$51: P_{3296} = (15,12,11,1)$
$52: P_{3302} = (5,13,11,1)$
$53: P_{3387} = (10,2,12,1)$
$54: P_{3405} = (12,3,12,1)$
$55: P_{3436} = (11,5,12,1)$
$56: P_{3447} = (6,6,12,1)$
$57: P_{3500} = (11,9,12,1)$
$58: P_{3511} = (6,10,12,1)$
$59: P_{3579} = (10,14,12,1)$
$60: P_{3597} = (12,15,12,1)$
$61: P_{3644} = (11,2,13,1)$
$62: P_{3675} = (10,4,13,1)$
$63: P_{3694} = (13,5,13,1)$
$64: P_{3720} = (7,7,13,1)$
$65: P_{3742} = (13,8,13,1)$
$66: P_{3755} = (10,9,13,1)$
$67: P_{3768} = (7,10,13,1)$
$68: P_{3852} = (11,15,13,1)$
$69: P_{4188} = (11,4,15,1)$
$70: P_{4216} = (7,6,15,1)$
$71: P_{4227} = (2,7,15,1)$
$72: P_{4243} = (2,8,15,1)$
$73: P_{4264} = (7,9,15,1)$
$74: P_{4300} = (11,11,15,1)$

Line Intersection Graph

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0	0	1	1	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	0	0
1	1	0	1	1	1	0	0	0	0	0	0	1	1	0	0	1	0	1	0	0	0
2	1	1	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	1
3	0	1	0	0	1	1	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0
4	0	1	0	1	0	0	1	0	1	1	0	0	0	0	1	0	0	0	1	0	1
5	0	0	1	1	0	0	1	0	1	0	0	0	1	0	1	0	1	1	0	0	0
6	0	0	1	0	1	1	0	0	0	0	1	1	0	1	0	1	0	0	1	0	0
7	0	0	1	1	0	0	0	0	1	1	0	1	0	1	1	1	0	1	1	0	0
8	1	0	0	0	1	1	0	1	0	0	1	0	1	0	0	1	0	0	0	0	1
9	0	0	1	0	1	0	0	1	0	0	1	0	1	1	1	1	1	1	0	0	0
10	1	0	0	1	0	0	1	0	1	1	0	1	0	0	0	0	0	1	0	1	0
11	0	1	0	0	0	0	1	1	0	0	1	0	1	0	1	0	1	0	0	0	1
12	0	1	0	0	0	1	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0
13	1	0	0	1	0	0	1	1	0	1	0	0	1	0	1	1	0	1	0	0	1
14	1	0	0	0	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
15	0	1	0	0	0	0	1	1	1	1	0	0	0	1	1	0	1	1	0	1	0
16	1	0	0	1	0	1	0	0	0	1	0	1	0	0	0	1	0	0	1	0	1
17	0	1	0	0	0	1	0	1	0	1	1	0	0	1	1	1	0	0	1	0	1
18	1	0	0	0	1	0	1	1	0	0	0	0	1	0	0	0	1	1	0	1	0
19	0	0	1	1	0	0	0	0	0	0	1	0	1	0	1	1	0	0	1	0	1
20	0	0	1	0	1	0	0	0	1	0	0	1	0	1	0	0	1	1	0	1	0

Neighbor sets in the line intersection graph:

Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_8	ℓ_{10}	ℓ_{13}	ℓ_{14}	ℓ_{16}	ℓ_{18}
in point	P_1	P_1	P_{641}	P_{625}	P_{689}	P_{705}	P_{737}	P_{721}

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_4	ℓ_{11}	ℓ_{12}	ℓ_{15}	ℓ_{17}
in point	P_1	P_1	P_{2945}	P_{3041}	P_{3025}	P_{2929}	P_{2913}	P_{3073}

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_5	ℓ_6	ℓ_7	ℓ_9	ℓ_{19}	ℓ_{20}
in point	P_1	P_1	P_{3281}	P_{3201}	P_{3217}	P_{3137}	P_{3297}	P_{3185}

Line 3 intersects

Line	ℓ_1	ℓ_4	ℓ_5	ℓ_7	ℓ_{10}	ℓ_{13}	ℓ_{16}	ℓ_{19}
in point	P_{2945}	P_{437}	P_{1339}	P_{4106}	P_{3750}	P_{2135}	P_{1248}	P_{1020}

Line 4 intersects

Line	ℓ_1	ℓ_3	ℓ_6	ℓ_8	ℓ_9	ℓ_{14}	ℓ_{18}	ℓ_{20}
in point	P_{3041}	P_{437}	P_{1403}	P_{3670}	P_{3882}	P_{2119}	P_{1296}	P_{988}

Line 5 intersects

Line	ℓ_2	ℓ_3	ℓ_6	ℓ_8	ℓ_{12}	ℓ_{14}	ℓ_{16}	ℓ_{17}
in point	P_{3281}	P_{1339}	P_{455}	P_{1652}	P_{2652}	P_{3502}	P_{2297}	P_{847}

Line 6 intersects

Line	ℓ_2	ℓ_4	ℓ_5	ℓ_{10}	ℓ_{11}	ℓ_{13}	ℓ_{15}	ℓ_{18}
in point	P_{3201}	P_{1403}	P_{455}	P_{1604}	P_{2796}	P_{3438}	P_{815}	P_{2217}

Line 7 intersects

Line	ℓ_2	ℓ_3	ℓ_8	ℓ_9	ℓ_{11}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{17}	ℓ_{18}
in point	P_{3217}	P_{4106}	P_{125}	P_{275}	P_{1315}	P_{275}	P_{275}	P_{275}	P_{275}	P_{3067}

Line 8 intersects

Line	ℓ_0	ℓ_4	ℓ_5	ℓ_7	ℓ_{10}	ℓ_{12}	ℓ_{15}	ℓ_{20}
in point	P_{641}	P_{3670}	P_{1652}	P_{125}	P_{300}	P_{3392}	P_{3244}	P_{4249}

Line 9 intersects

Line	ℓ_2	ℓ_4	ℓ_7	ℓ_{10}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}
in point	P_{3137}	P_{3882}	P_{275}	P_{141}	P_{1379}	P_{275}	P_{275}	P_{275}	P_{2907}	P_{275}

Line 10 intersects

Line	ℓ_0	ℓ_3	ℓ_6	ℓ_8	ℓ_9	ℓ_{11}	ℓ_{17}	ℓ_{19}
in point	P_{625}	P_{3750}	P_{1604}	P_{300}	P_{141}	P_{3584}	P_{3132}	P_{4233}

Line 11 intersects

Line	ℓ_1	ℓ_6	ℓ_7	ℓ_{10}	ℓ_{12}	ℓ_{14}	ℓ_{16}	ℓ_{20}
in point	P_{3025}	P_{2796}	P_{1315}	P_{3584}	P_{442}	P_{1944}	P_{2406}	P_{3979}

Line 12 intersects

Line	ℓ_1	ℓ_5	ℓ_8	ℓ_9	ℓ_{11}	ℓ_{13}	ℓ_{18}	ℓ_{19}
in point	P_{2929}	P_{2652}	P_{3392}	P_{1379}	P_{442}	P_{2040}	P_{2534}	P_{4011}

Line 13 intersects

Line	ℓ_0	ℓ_3	ℓ_6	ℓ_7	ℓ_9	ℓ_{12}	ℓ_{14}	ℓ_{15}	ℓ_{17}	ℓ_{20}
in point	P_{689}	P_{2135}	P_{3438}	P_{275}	P_{275}	P_{2040}	P_{275}	P_{275}	P_{275}	P_{3853}

Line 14 intersects

Line	ℓ_0	ℓ_4	ℓ_5	ℓ_7	ℓ_9	ℓ_{11}	ℓ_{13}	ℓ_{15}	ℓ_{17}	ℓ_{19}
in point	P_{705}	P_{2119}	P_{3502}	P_{275}	P_{275}	P_{1944}	P_{275}	P_{275}	P_{275}	P_{3645}

Line 15 intersects

Line	ℓ_1	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{13}	ℓ_{14}	ℓ_{16}	ℓ_{17}	ℓ_{19}
in point	P_{2913}	P_{815}	P_{275}	P_{3244}	P_{275}	P_{275}	P_{275}	P_{222}	P_{275}	P_{2709}

Line 16 intersects

Line	ℓ_0	ℓ_3	ℓ_5	ℓ_9	ℓ_{11}	ℓ_{15}	ℓ_{18}	ℓ_{20}
in point	P_{737}	P_{1248}	P_{2297}	P_{2907}	P_{2406}	P_{222}	P_{301}	P_{1844}

Line 17 intersects

Line	ℓ_1	ℓ_5	ℓ_7	ℓ_9	ℓ_{10}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{18}	ℓ_{20}
in point	P_{3073}	P_{847}	P_{275}	P_{275}	P_{3132}	P_{275}	P_{275}	P_{275}	P_{238}	P_{2597}

Line 18 intersects

Line	ℓ_0	ℓ_4	ℓ_6	ℓ_7	ℓ_{12}	ℓ_{16}	ℓ_{17}	ℓ_{19}
in point	P_{721}	P_{1296}	P_{2217}	P_{3067}	P_{2534}	P_{301}	P_{238}	P_{1876}

Line 19 intersects

Line	ℓ_2	ℓ_3	ℓ_{10}	ℓ_{12}	ℓ_{14}	ℓ_{15}	ℓ_{18}	ℓ_{20}
in point	P_{3297}	P_{1020}	P_{4233}	P_{4011}	P_{3645}	P_{2709}	P_{1876}	P_{465}

Line 20 intersects

Line	ℓ_2	ℓ_4	ℓ_8	ℓ_{11}	ℓ_{13}	ℓ_{16}	ℓ_{17}	ℓ_{19}
in point	P_{3185}	P_{988}	P_{4249}	P_{3979}	P_{3853}	P_{1844}	P_{2597}	P_{465}

The surface has 353 points:
The points on the surface are:

0 : $P_0 = (1,0,0,0)$
1 : $P_1 = (0,1,0,0)$
2 : $P_{55} = (4,2,1,0)$
3 : $P_{71} = (4,3,1,0)$
4 : $P_{92} = (9,4,1,0)$
5 : $P_{108} = (9,5,1,0)$
6 : $P_{125} = (10,6,1,0)$
7 : $P_{141} = (10,7,1,0)$
8 : $P_{161} = (14,8,1,0)$
9 : $P_{177} = (14,9,1,0)$
10 : $P_{180} = (1,10,1,0)$
11 : $P_{196} = (1,11,1,0)$
12 : $P_{222} = (11,12,1,0)$
13 : $P_{238} = (11,13,1,0)$
14 : $P_{245} = (2,14,1,0)$
15 : $P_{261} = (2,15,1,0)$
16 : $P_{275} = (1,0,0,1)$
17 : $P_{300} = (10,1,0,1)$
18 : $P_{301} = (11,1,0,1)$
19 : $P_{315} = (9,2,0,1)$
20 : $P_{319} = (13,2,0,1)$
21 : $P_{345} = (7,4,0,1)$
22 : $P_{352} = (14,4,0,1)$
23 : $P_{420} = (2,9,0,1)$
24 : $P_{430} = (12,9,0,1)$
25 : $P_{437} = (3,10,0,1)$
26 : $P_{442} = (8,10,0,1)$
27 : $P_{455} = (5,11,0,1)$
28 : $P_{465} = (15,11,0,1)$
29 : $P_{502} = (4,14,0,1)$
30 : $P_{504} = (6,14,0,1)$
31 : $P_{530} = (0,0,1,1)$
32 : $P_{546} = (0,1,1,1)$
33 : $P_{561} = (0,2,1,1)$
34 : $P_{567} = (6,2,1,1)$
35 : $P_{577} = (0,3,1,1)$
36 : $P_{583} = (6,3,1,1)$
37 : $P_{593} = (0,4,1,1)$
38 : $P_{606} = (13,4,1,1)$
39 : $P_{609} = (0,5,1,1)$
40 : $P_{622} = (13,5,1,1)$
41 : $P_{625} = (0,6,1,1)$
42 : $P_{636} = (11,6,1,1)$
43 : $P_{641} = (0,7,1,1)$
44 : $P_{652} = (11,7,1,1)$
45 : $P_{657} = (0,8,1,1)$
46 : $P_{664} = (7,8,1,1)$
47 : $P_{673} = (0,9,1,1)$
48 : $P_{680} = (7,9,1,1)$
49 : $P_{689} = (0,10,1,1)$
50 : $P_{690} = (1,10,1,1)$
51 : $P_{705} = (0,11,1,1)$
52 : $P_{706} = (1,11,1,1)$
53 : $P_{721} = (0,12,1,1)$
54 : $P_{731} = (10,12,1,1)$
55 : $P_{737} = (0,13,1,1)$
56 : $P_{747} = (10,13,1,1)$
57 : $P_{753} = (0,14,1,1)$
58 : $P_{765} = (12,14,1,1)$
59 : $P_{769} = (0,15,1,1)$
60 : $P_{781} = (12,15,1,1)$
61 : $P_{789} = (4,0,2,1)$
62 : $P_{814} = (13,1,2,1)$
63 : $P_{815} = (14,1,2,1)$
64 : $P_{821} = (4,2,2,1)$
65 : $P_{846} = (13,3,2,1)$
66 : $P_{847} = (14,3,2,1)$
67 : $P_{988} = (11,12,2,1)$
68 : $P_{989} = (12,12,2,1)$
69 : $P_{996} = (3,13,2,1)$
70 : $P_{1000} = (7,13,2,1)$
71 : $P_{1020} = (11,14,2,1)$
72 : $P_{1021} = (12,14,2,1)$
73 : $P_{1028} = (3,15,2,1)$
74 : $P_{1032} = (7,15,2,1)$
75 : $P_{1050} = (9,0,3,1)$
76 : $P_{1098} = (9,3,3,1)$
77 : $P_{1107} = (2,4,3,1)$
78 : $P_{1112} = (7,4,3,1)$
79 : $P_{1155} = (2,7,3,1)$
80 : $P_{1160} = (7,7,3,1)$
81 : $P_{1172} = (3,8,3,1)$
82 : $P_{1182} = (13,8,3,1)$
83 : $P_{1191} = (6,9,3,1)$
84 : $P_{1195} = (10,9,3,1)$
85 : $P_{1207} = (6,10,3,1)$
86 : $P_{1211} = (10,10,3,1)$
87 : $P_{1220} = (3,11,3,1)$
88 : $P_{1230} = (13,11,3,1)$
89 : $P_{1237} = (4,12,3,1)$
90 : $P_{1248} = (15,12,3,1)$
91 : $P_{1254} = (5,13,3,1)$
92 : $P_{1261} = (12,13,3,1)$
93 : $P_{1270} = (5,14,3,1)$
94 : $P_{1277} = (12,14,3,1)$
95 : $P_{1285} = (4,15,3,1)$
96 : $P_{1296} = (15,15,3,1)$
97 : $P_{1306} = (9,0,4,1)$
98 : $P_{1315} = (2,1,4,1)$
99 : $P_{1320} = (7,1,4,1)$
100 : $P_{1335} = (6,2,4,1)$
101 : $P_{1339} = (10,2,4,1)$
102 : $P_{1350} = (5,3,4,1)$
103 : $P_{1357} = (12,3,4,1)$
104 : $P_{1370} = (9,4,4,1)$
105 : $P_{1379} = (2,5,4,1)$
106 : $P_{1384} = (7,5,4,1)$
107 : $P_{1399} = (6,6,4,1)$
108 : $P_{1403} = (10,6,4,1)$
109 : $P_{1414} = (5,7,4,1)$
110 : $P_{1421} = (12,7,4,1)$
111 : $P_{1567} = (14,0,5,1)$
112 : $P_{1591} = (6,2,5,1)$
113 : $P_{1593} = (8,2,5,1)$
114 : $P_{1604} = (3,3,5,1)$
115 : $P_{1610} = (9,3,5,1)$
116 : $P_{1647} = (14,5,5,1)$
117 : $P_{1652} = (3,6,5,1)$
118 : $P_{1658} = (9,6,5,1)$
119 : $P_{1671} = (6,7,5,1)$
120 : $P_{1673} = (8,7,5,1)$
121 : $P_{1701} = (4,9,5,1)$
122 : $P_{1709} = (12,9,5,1)$
123 : $P_{1718} = (5,10,5,1)$
124 : $P_{1720} = (7,10,5,1)$
125 : $P_{1740} = (11,11,5,1)$
126 : $P_{1742} = (13,11,5,1)$
127 : $P_{1749} = (4,12,5,1)$
128 : $P_{1757} = (12,12,5,1)$
129 : $P_{1788} = (11,14,5,1)$
130 : $P_{1790} = (13,14,5,1)$
131 : $P_{1798} = (5,15,5,1)$
132 : $P_{1800} = (7,15,5,1)$
133 : $P_{1811} = (2,0,6,1)$
134 : $P_{1844} = (3,2,6,1)$

135 : $P_{1852} = (11, 2, 6, 1)$
136 : $P_{1863} = (6, 3, 6, 1)$
137 : $P_{1866} = (9, 3, 6, 1)$
138 : $P_{1876} = (3, 4, 6, 1)$
139 : $P_{1884} = (11, 4, 6, 1)$
140 : $P_{1895} = (6, 5, 6, 1)$
141 : $P_{1898} = (9, 5, 6, 1)$
142 : $P_{1907} = (2, 6, 6, 1)$
143 : $P_{1944} = (7, 8, 6, 1)$
144 : $P_{1947} = (10, 8, 6, 1)$
145 : $P_{1970} = (1, 10, 6, 1)$
146 : $P_{1973} = (4, 10, 6, 1)$
147 : $P_{1998} = (13, 11, 6, 1)$
148 : $P_{2000} = (15, 11, 6, 1)$
149 : $P_{2002} = (1, 12, 6, 1)$
150 : $P_{2005} = (4, 12, 6, 1)$
151 : $P_{2030} = (13, 13, 6, 1)$
152 : $P_{2032} = (15, 13, 6, 1)$
153 : $P_{2040} = (7, 14, 6, 1)$
154 : $P_{2043} = (10, 14, 6, 1)$
155 : $P_{2074} = (9, 0, 7, 1)$
156 : $P_{2119} = (6, 3, 7, 1)$
157 : $P_{2123} = (10, 3, 7, 1)$
158 : $P_{2135} = (6, 4, 7, 1)$
159 : $P_{2139} = (10, 4, 7, 1)$
160 : $P_{2186} = (9, 7, 7, 1)$
161 : $P_{2195} = (2, 8, 7, 1)$
162 : $P_{2200} = (7, 8, 7, 1)$
163 : $P_{2217} = (8, 9, 7, 1)$
164 : $P_{2220} = (11, 9, 7, 1)$
165 : $P_{2226} = (1, 10, 7, 1)$
166 : $P_{2239} = (14, 10, 7, 1)$
167 : $P_{2246} = (5, 11, 7, 1)$
168 : $P_{2253} = (12, 11, 7, 1)$
169 : $P_{2262} = (5, 12, 7, 1)$
170 : $P_{2269} = (12, 12, 7, 1)$
171 : $P_{2274} = (1, 13, 7, 1)$
172 : $P_{2287} = (14, 13, 7, 1)$
173 : $P_{2297} = (8, 14, 7, 1)$
174 : $P_{2300} = (11, 14, 7, 1)$
175 : $P_{2307} = (2, 15, 7, 1)$
176 : $P_{2312} = (7, 15, 7, 1)$
177 : $P_{2323} = (2, 0, 8, 1)$
178 : $P_{2360} = (7, 2, 8, 1)$
179 : $P_{2363} = (10, 2, 8, 1)$
180 : $P_{2377} = (8, 3, 8, 1)$
181 : $P_{2381} = (12, 3, 8, 1)$
182 : $P_{2398} = (13, 4, 8, 1)$
183 : $P_{2400} = (15, 4, 8, 1)$
184 : $P_{2406} = (5, 5, 8, 1)$
185 : $P_{2415} = (14, 5, 8, 1)$
186 : $P_{2423} = (6, 6, 8, 1)$
187 : $P_{2426} = (9, 6, 8, 1)$
188 : $P_{2451} = (2, 8, 8, 1)$
189 : $P_{2488} = (7, 10, 8, 1)$
190 : $P_{2491} = (10, 10, 8, 1)$
191 : $P_{2505} = (8, 11, 8, 1)$
192 : $P_{2509} = (12, 11, 8, 1)$
193 : $P_{2526} = (13, 12, 8, 1)$
194 : $P_{2528} = (15, 12, 8, 1)$
195 : $P_{2534} = (5, 13, 8, 1)$
196 : $P_{2543} = (14, 13, 8, 1)$
197 : $P_{2551} = (6, 14, 8, 1)$
198 : $P_{2554} = (9, 14, 8, 1)$
199 : $P_{2591} = (14, 0, 9, 1)$
200 : $P_{2597} = (4, 1, 9, 1)$
201 : $P_{2605} = (12, 1, 9, 1)$
202 : $P_{2652} = (11, 4, 9, 1)$
203 : $P_{2654} = (13, 4, 9, 1)$
204 : $P_{2663} = (6, 5, 9, 1)$
205 : $P_{2665} = (8, 5, 9, 1)$
206 : $P_{2709} = (4, 8, 9, 1)$
207 : $P_{2717} = (12, 8, 9, 1)$
208 : $P_{2735} = (14, 9, 9, 1)$
209 : $P_{2775} = (6, 12, 9, 1)$
210 : $P_{2777} = (8, 12, 9, 1)$
211 : $P_{2796} = (11, 13, 9, 1)$
212 : $P_{2798} = (13, 13, 9, 1)$
213 : $P_{2833} = (0, 0, 10, 1)$
214 : $P_{2849} = (0, 1, 10, 1)$
215 : $P_{2860} = (11, 1, 10, 1)$
216 : $P_{2865} = (0, 2, 10, 1)$
217 : $P_{2874} = (9, 2, 10, 1)$
218 : $P_{2881} = (0, 3, 10, 1)$
219 : $P_{2883} = (2, 3, 10, 1)$
220 : $P_{2897} = (0, 4, 10, 1)$
221 : $P_{2907} = (10, 4, 10, 1)$
222 : $P_{2913} = (0, 5, 10, 1)$
223 : $P_{2914} = (1, 5, 10, 1)$
224 : $P_{2929} = (0, 6, 10, 1)$
225 : $P_{2932} = (3, 6, 10, 1)$
226 : $P_{2945} = (0, 7, 10, 1)$
227 : $P_{2953} = (8, 7, 10, 1)$
228 : $P_{2961} = (0, 8, 10, 1)$
229 : $P_{2970} = (9, 8, 10, 1)$
230 : $P_{2977} = (0, 9, 10, 1)$
231 : $P_{2979} = (2, 9, 10, 1)$
232 : $P_{2993} = (0, 10, 10, 1)$
233 : $P_{3009} = (0, 11, 10, 1)$
234 : $P_{3020} = (11, 11, 10, 1)$
235 : $P_{3025} = (0, 12, 10, 1)$
236 : $P_{3028} = (3, 12, 10, 1)$
237 : $P_{3041} = (0, 13, 10, 1)$
238 : $P_{3049} = (8, 13, 10, 1)$
239 : $P_{3057} = (0, 14, 10, 1)$
240 : $P_{3067} = (10, 14, 10, 1)$
241 : $P_{3073} = (0, 15, 10, 1)$
242 : $P_{3074} = (1, 15, 10, 1)$
243 : $P_{3089} = (0, 0, 11, 1)$
244 : $P_{3105} = (0, 1, 11, 1)$
245 : $P_{3115} = (10, 1, 11, 1)$
246 : $P_{3121} = (0, 2, 11, 1)$
247 : $P_{3132} = (11, 2, 11, 1)$
248 : $P_{3137} = (0, 3, 11, 1)$
249 : $P_{3138} = (1, 3, 11, 1)$
250 : $P_{3153} = (0, 4, 11, 1)$
251 : $P_{3167} = (14, 4, 11, 1)$
252 : $P_{3169} = (0, 5, 11, 1)$
253 : $P_{3173} = (4, 5, 11, 1)$
254 : $P_{3185} = (0, 6, 11, 1)$
255 : $P_{3190} = (5, 6, 11, 1)$
256 : $P_{3201} = (0, 7, 11, 1)$
257 : $P_{3216} = (15, 7, 11, 1)$
258 : $P_{3217} = (0, 8, 11, 1)$
259 : $P_{3218} = (1, 8, 11, 1)$
260 : $P_{3233} = (0, 9, 11, 1)$
261 : $P_{3244} = (11, 9, 11, 1)$
262 : $P_{3249} = (0, 10, 11, 1)$
263 : $P_{3259} = (10, 10, 11, 1)$
264 : $P_{3265} = (0, 11, 11, 1)$
265 : $P_{3281} = (0, 12, 11, 1)$
266 : $P_{3296} = (15, 12, 11, 1)$
267 : $P_{3297} = (0, 13, 11, 1)$
268 : $P_{3302} = (5, 13, 11, 1)$
269 : $P_{3313} = (0, 14, 11, 1)$
270 : $P_{3317} = (4, 14, 11, 1)$
271 : $P_{3329} = (0, 15, 11, 1)$
272 : $P_{3343} = (14, 15, 11, 1)$
273 : $P_{3359} = (14, 0, 12, 1)$
274 : $P_{3387} = (10, 2, 12, 1)$
275 : $P_{3392} = (15, 2, 12, 1)$
276 : $P_{3397} = (4, 3, 12, 1)$
277 : $P_{3405} = (12, 3, 12, 1)$
278 : $P_{3436} = (11, 5, 12, 1)$
279 : $P_{3438} = (13, 5, 12, 1)$
280 : $P_{3447} = (6, 6, 12, 1)$
281 : $P_{3449} = (8, 6, 12, 1)$
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283 : $P_{3459} = (2, 7, 12, 1)$
284 : $P_{3500} = (11, 9, 12, 1)$
285 : $P_{3502} = (13, 9, 12, 1)$
286 : $P_{3511} = (6, 10, 12, 1)$
287 : $P_{3513} = (8, 10, 12, 1)$
288 : $P_{3522} = (1, 11, 12, 1)$
289 : $P_{3523} = (2, 11, 12, 1)$
290 : $P_{3551} = (14, 12, 12, 1)$
291 : $P_{3579} = (10, 14, 12, 1)$
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293 : $P_{3589} = (4, 15, 12, 1)$
294 : $P_{3597} = (12, 15, 12, 1)$
295 : $P_{3605} = (4, 0, 13, 1)$
296 : $P_{3644} = (11, 2, 13, 1)$

297 : $P_{3645} = (12, 2, 13, 1)$
298 : $P_{3670} = (5, 4, 13, 1)$
299 : $P_{3675} = (10, 4, 13, 1)$
300 : $P_{3694} = (13, 5, 13, 1)$
301 : $P_{3695} = (14, 5, 13, 1)$
302 : $P_{3698} = (1, 6, 13, 1)$
303 : $P_{3706} = (9, 6, 13, 1)$
304 : $P_{3716} = (3, 7, 13, 1)$
305 : $P_{3720} = (7, 7, 13, 1)$
306 : $P_{3742} = (13, 8, 13, 1)$
307 : $P_{3743} = (14, 8, 13, 1)$
308 : $P_{3750} = (5, 9, 13, 1)$
309 : $P_{3755} = (10, 9, 13, 1)$
310 : $P_{3764} = (3, 10, 13, 1)$
311 : $P_{3768} = (7, 10, 13, 1)$
312 : $P_{3778} = (1, 11, 13, 1)$
313 : $P_{3786} = (9, 11, 13, 1)$
314 : $P_{3813} = (4, 13, 13, 1)$
315 : $P_{3852} = (11, 15, 13, 1)$
316 : $P_{3853} = (12, 15, 13, 1)$
317 : $P_{3859} = (2, 0, 14, 1)$
318 : $P_{3879} = (6, 1, 14, 1)$
319 : $P_{3882} = (9, 1, 14, 1)$
320 : $P_{3966} = (13, 6, 14, 1)$
321 : $P_{3968} = (15, 6, 14, 1)$
322 : $P_{3976} = (7, 7, 14, 1)$
323 : $P_{3979} = (10, 7, 14, 1)$
324 : $P_{3998} = (13, 8, 14, 1)$
325 : $P_{4000} = (15, 8, 14, 1)$
326 : $P_{4008} = (7, 9, 14, 1)$
327 : $P_{4011} = (10, 9, 14, 1)$
328 : $P_{4083} = (2, 14, 14, 1)$
329 : $P_{4103} = (6, 15, 14, 1)$
330 : $P_{4106} = (9, 15, 14, 1)$
331 : $P_{4117} = (4, 0, 15, 1)$
332 : $P_{4158} = (13, 2, 15, 1)$
333 : $P_{4159} = (14, 2, 15, 1)$
334 : $P_{4188} = (11, 4, 15, 1)$
335 : $P_{4189} = (12, 4, 15, 1)$
336 : $P_{4199} = (6, 5, 15, 1)$
337 : $P_{4208} = (15, 5, 15, 1)$
338 : $P_{4212} = (3, 6, 15, 1)$
339 : $P_{4216} = (7, 6, 15, 1)$
340 : $P_{4227} = (2, 7, 15, 1)$
341 : $P_{4233} = (8, 7, 15, 1)$
342 : $P_{4243} = (2, 8, 15, 1)$
343 : $P_{4249} = (8, 8, 15, 1)$
344 : $P_{4260} = (3, 9, 15, 1)$
345 : $P_{4264} = (7, 9, 15, 1)$
346 : $P_{4279} = (6, 10, 15, 1)$
347 : $P_{4288} = (15, 10, 15, 1)$
348 : $P_{4300} = (11, 11, 15, 1)$
349 : $P_{4301} = (12, 11, 15, 1)$
350 : $P_{4334} = (13, 13, 15, 1)$
351 : $P_{4335} = (14, 13, 15, 1)$
352 : $P_{4357} = (4, 15, 15, 1)$