Rank-331 over GF(16)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
The point rank of the equation over GF(16) is 303108381

General information

Number of lines	19
Number of points	289
Number of singular points	17
Number of Eckardt points	0
Number of double points	34
Number of single points	255
Number of points off lines	0
Number of Hesse planes	0
Number of axes	0
Type of points on lines	17^{19}
Type of lines on points	2^{34}, 1^{255}

Singular Points

The surface has 17 singular points:

0 : $P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$
1 : $P_3 = \mathbf{P}(0,0,0,1) = \mathbf{P}(0,0,0,1)$
2 : $P_{530} = \mathbf{P}(0,0,1,1) = \mathbf{P}(0,0,1,1)$
3 : $P_{785} = \mathbf{P}(0,0,\delta,1) = \mathbf{P}(0,0,2,1)$
4 : $P_{1041} = \mathbf{P}(0,0,\delta^{12},1) = \mathbf{P}(0,0,3,1)$
5 : $P_{1297} = \mathbf{P}(0,0,\delta^{2},1) = \mathbf{P}(0,0,4,1)$
6 : $P_{1553} = \mathbf{P}(0,0,\delta^{9},1) = \mathbf{P}(0,0,5,1)$
7 : $P_{1809} = \mathbf{P}(0,0,\delta^{13},1) = \mathbf{P}(0,0,6,1)$
8 : $P_{2065} = \mathbf{P}(0,0,\delta^{7},1) = \mathbf{P}(0,0,7,1)$
9 : $P_{2321} = \mathbf{P}(0,0,\delta^{3},1) = \mathbf{P}(0,0,8,1)$
10 : $P_{2577} = \mathbf{P}(0,0,\delta^{4},1) = \mathbf{P}(0,0,9,1)$
11 : $P_{2833} = \mathbf{P}(0,0,\delta^{10},1) = \mathbf{P}(0,0,10,1)$
12 : $P_{3089} = \mathbf{P}(0,0,\delta^{5},1) = \mathbf{P}(0,0,11,1)$
13 : $P_{3345} = \mathbf{P}(0,0,\delta^{14},1) = \mathbf{P}(0,0,12,1)$
14 : $P_{3601} = \mathbf{P}(0,0,\delta^{11},1) = \mathbf{P}(0,0,13,1)$
15 : $P_{3857} = \mathbf{P}(0,0,\delta^{8},1) = \mathbf{P}(0,0,14,1)$
16 : $P_{4113} = \mathbf{P}(0,0,\delta^{6},1) = \mathbf{P}(0,0,15,1)$

The 19 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}_0 = \mathbf{Pl}(1,0,0,0,0,0)_0$$

$$\ell_1 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{256} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{256} = \mathbf{Pl}(0,0,1,0,0,0)_2$$

$$\ell_2 = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{69904} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{69904} = \mathbf{Pl}(0,0,0,1,0,0)_{33}$$

$$\ell_3 = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{70160} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{70160} = \mathbf{Pl}(0,1,0,0,0,0)_1$$

$$\ell_4 = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{530} = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{530} = \mathbf{Pl}(0,0,1,1,1,1)_{9426}$$

$$\ell_5 = \begin{bmatrix} 1 & \delta^{14} & 0 & 0 \\ 0 & 0 & 1 & \delta^{13} \end{bmatrix}_{3538} = \begin{bmatrix} 1 & 12 & 0 & 0 \\ 0 & 0 & 1 & 6 \end{bmatrix}_{3538} = \mathbf{Pl}(0,0,4,6,12,1)_{54399}$$

$$\ell_6 = \begin{bmatrix} 1 & \delta^{3} & 0 & 0 \\ 0 & 0 & 1 & \delta^{6} \end{bmatrix}_{2455} = \begin{bmatrix} 1 & 8 & 0 & 0 \\ 0 & 0 & 1 & 15 \end{bmatrix}_{2455} = \mathbf{Pl}(0,0,5,15,8,1)_{38110}$$

$$\ell_7 = \begin{bmatrix} 1 & \delta^{13} & 0 & 0 \\ 0 & 0 & 1 & \delta^{11} \end{bmatrix}_{1907} = \begin{bmatrix} 1 & 6 & 0 & 0 \\ 0 & 0 & 1 & 13 \end{bmatrix}_{1907} = \mathbf{Pl}(0,0,9,13,6,1)_{30074}$$

$$\ell_8 = \begin{bmatrix} 1 & \delta^{6} & 0 & 0 \\ 0 & 0 & 1 & \delta^{12} \end{bmatrix}_{4354} = \begin{bmatrix} 1 & 15 & 0 & 0 \\ 0 & 0 & 1 & 3 \end{bmatrix}_{4354} = \mathbf{Pl}(0,0,8,3,15,1)_{66763}$$

$$\ell_9 = \begin{bmatrix} 1 & \delta^{2} & 0 & 0 \\ 0 & 0 & 1 & \delta^{4} \end{bmatrix}_{1357} = \begin{bmatrix} 1 & 4 & 0 & 0 \\ 0 & 0 & 1 & 9 \end{bmatrix}_{1357} = \mathbf{Pl}(0,0,13,9,4,1)_{22038}$$

$$\ell_{10} = \begin{bmatrix} 1 & \delta^{8} & 0 & 0 \\ 0 & 0 & 1 & \delta \end{bmatrix}_{4080} = \begin{bmatrix} 1 & 14 & 0 & 0 \\ 0 & 0 & 1 & 2 \end{bmatrix}_{4080} = \mathbf{Pl}(0,0,12,2,14,1)_{62807}$$

$$\ell_{11} = \begin{bmatrix} 1 & \delta^{12} & 0 & 0 \\ 0 & 0 & 1 & \delta^{9} \end{bmatrix}_{1080} = \begin{bmatrix} 1 & 3 & 0 & 0 \\ 0 & 0 & 1 & 5 \end{bmatrix}_{1080} = \mathbf{Pl}(0,0,15,5,3,1)_{18020}$$

$$\ell_{12} = \begin{bmatrix} 1 & \delta^{11} & 0 & 0 \\ 0 & 0 & 1 & \delta^{7} \end{bmatrix}_{3812} = \begin{bmatrix} 1 & 13 & 0 & 0 \\ 0 & 0 & 1 & 7 \end{bmatrix}_{3812} = \mathbf{Pl}(0,0,14,7,13,1)_{58789}$$

$$\ell_{13} = \begin{bmatrix} 1 & \delta^{5} & 0 & 0 \\ 0 & 0 & 1 & \delta^{10} \end{bmatrix}_{3269} = \begin{bmatrix} 1 & 11 & 0 & 0 \\ 0 & 0 & 1 & 10 \end{bmatrix}_{3269} = \mathbf{Pl}(0,0,11,10,11,1)_{50536}$$

$$\ell_{14} = \begin{bmatrix} 1 & \delta^{10} & 0 & 0 \\ 0 & 0 & 1 & \delta^{5} \end{bmatrix}_{2997} = \begin{bmatrix} 1 & 10 & 0 & 0 \\ 0 & 0 & 1 & 11 \end{bmatrix}_{2997} = \mathbf{Pl}(0,0,10,11,10,1)_{46425}$$

$$\ell_{15} = \begin{bmatrix} 1 & \delta & 0 & 0 \\ 0 & 0 & 1 & \delta^{2} \end{bmatrix}_{806} = \begin{bmatrix} 1 & 2 & 0 & 0 \\ 0 & 0 & 1 & 4 \end{bmatrix}_{806} = \mathbf{Pl}(0,0,6,4,2,1)_{13661}$$

$$\ell_{16} = \begin{bmatrix} 1 & \delta^{4} & 0 & 0 \\ 0 & 0 & 1 & \delta^{8} \end{bmatrix}_{2727} = \begin{bmatrix} 1 & 9 & 0 & 0 \\ 0 & 0 & 1 & 14 \end{bmatrix}_{2727} = \mathbf{Pl}(0,0,7,14,9,1)_{42252}$$

$$\ell_{17} = \begin{bmatrix} 1 & \delta^{7} & 0 & 0 \\ 0 & 0 & 1 & \delta^{14} \end{bmatrix}_{2179} = \begin{bmatrix} 1 & 7 & 0 & 0 \\ 0 & 0 & 1 & 12 \end{bmatrix}_{2179} = \mathbf{Pl}(0,0,2,12,7,1)_{33937}$$

$$\ell_{18} = \begin{bmatrix} 1 & \delta^{9} & 0 & 0 \\ 0 & 0 & 1 & \delta^{3} \end{bmatrix}_{1629} = \begin{bmatrix} 1 & 5 & 0 & 0 \\ 0 & 0 & 1 & 8 \end{bmatrix}_{1629} = \mathbf{Pl}(0,0,3,8,5,1)_{25808}$$

Rank of lines: (0, 256, 69904, 70160, 530, 3538, 2455, 1907, 4354, 1357, 4080, 1080, 3812, 3269, 2997, 806, 2727, 2179, 1629)
Rank of points on Klein quadric: (0, 2, 33, 1, 9426, 54399, 38110, 30074, 66763, 22038, 62807, 18020, 58789, 50536, 46425, 13661, 42252, 33937, 25808)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

The surface has 34 Double points:
The double points on the surface are:

$P_0 = (1,0,0,0) = \ell_0 \cap \ell_1$
$P_1 = (0,1,0,0) = \ell_0 \cap \ell_2$
$P_5 = (1,1,0,0) = \ell_0 \cap \ell_4$
$P_6 = (2,1,0,0) = \ell_0 \cap \ell_5$
$P_7 = (3,1,0,0) = \ell_0 \cap \ell_6$
$P_8 = (4,1,0,0) = \ell_0 \cap \ell_7$
$P_9 = (5,1,0,0) = \ell_0 \cap \ell_8$
$P_{10} = (6,1,0,0) = \ell_0 \cap \ell_9$
$P_{11} = (7,1,0,0) = \ell_0 \cap \ell_{10}$
$P_{12} = (8,1,0,0) = \ell_0 \cap \ell_{11}$
$P_{13} = (9,1,0,0) = \ell_0 \cap \ell_{12}$
$P_{14} = (10,1,0,0) = \ell_0 \cap \ell_{13}$
$P_{15} = (11,1,0,0) = \ell_0 \cap \ell_{14}$
$P_{16} = (12,1,0,0) = \ell_0 \cap \ell_{15}$
$P_{17} = (13,1,0,0) = \ell_0 \cap \ell_{16}$
$P_{18} = (14,1,0,0) = \ell_0 \cap \ell_{17}$
$P_{19} = (15,1,0,0) = \ell_0 \cap \ell_{18}$
$P_2 = (0,0,1,0) = \ell_1 \cap \ell_3$
$P_3 = (0,0,0,1) = \ell_2 \cap \ell_3$
$P_{530} = (0,0,1,1) = \ell_3 \cap \ell_4$
$P_{1297} = (0,0,4,1) = \ell_3 \cap \ell_5$
$P_{1553} = (0,0,5,1) = \ell_3 \cap \ell_6$
$P_{2577} = (0,0,9,1) = \ell_3 \cap \ell_7$
$P_{2321} = (0,0,8,1) = \ell_3 \cap \ell_8$
$P_{3601} = (0,0,13,1) = \ell_3 \cap \ell_9$
$P_{3345} = (0,0,12,1) = \ell_3 \cap \ell_{10}$
$P_{4113} = (0,0,15,1) = \ell_3 \cap \ell_{11}$
$P_{3857} = (0,0,14,1) = \ell_3 \cap \ell_{12}$
$P_{3089} = (0,0,11,1) = \ell_3 \cap \ell_{13}$
$P_{2833} = (0,0,10,1) = \ell_3 \cap \ell_{14}$
$P_{1809} = (0,0,6,1) = \ell_3 \cap \ell_{15}$
$P_{2065} = (0,0,7,1) = \ell_3 \cap \ell_{16}$
$P_{785} = (0,0,2,1) = \ell_3 \cap \ell_{17}$
$P_{1041} = (0,0,3,1) = \ell_3 \cap \ell_{18}$

Single Points

The surface has 255 single points:
The single points on the surface are:

0 : $P_4 = (1,1,1,1)$ lies on line ℓ_4
1 : $P_{20} = (1,0,1,0)$ lies on line ℓ_1
2 : $P_{21} = (2,0,1,0)$ lies on line ℓ_1
3 : $P_{22} = (3,0,1,0)$ lies on line ℓ_1
4 : $P_{23} = (4,0,1,0)$ lies on line ℓ_1
5 : $P_{24} = (5,0,1,0)$ lies on line ℓ_1
6 : $P_{25} = (6,0,1,0)$ lies on line ℓ_1
7 : $P_{26} = (7,0,1,0)$ lies on line ℓ_1
8 : $P_{27} = (8,0,1,0)$ lies on line ℓ_1
9 : $P_{28} = (9,0,1,0)$ lies on line ℓ_1
10 : $P_{29} = (10,0,1,0)$ lies on line ℓ_1
11 : $P_{30} = (11,0,1,0)$ lies on line ℓ_1
12 : $P_{31} = (12,0,1,0)$ lies on line ℓ_1
13 : $P_{32} = (13,0,1,0)$ lies on line ℓ_1
14 : $P_{33} = (14,0,1,0)$ lies on line ℓ_1
15 : $P_{34} = (15,0,1,0)$ lies on line ℓ_1
16 : $P_{290} = (0,1,0,1)$ lies on line ℓ_2
17 : $P_{306} = (0,2,0,1)$ lies on line ℓ_2
18 : $P_{322} = (0,3,0,1)$ lies on line ℓ_2
19 : $P_{338} = (0,4,0,1)$ lies on line ℓ_2
20 : $P_{354} = (0,5,0,1)$ lies on line ℓ_2
21 : $P_{370} = (0,6,0,1)$ lies on line ℓ_2
22 : $P_{386} = (0,7,0,1)$ lies on line ℓ_2
23 : $P_{402} = (0,8,0,1)$ lies on line ℓ_2
24 : $P_{418} = (0,9,0,1)$ lies on line ℓ_2
25 : $P_{434} = (0,10,0,1)$ lies on line ℓ_2
26 : $P_{450} = (0,11,0,1)$ lies on line ℓ_2
27 : $P_{466} = (0,12,0,1)$ lies on line ℓ_2
28 : $P_{482} = (0,13,0,1)$ lies on line ℓ_2
29 : $P_{498} = (0,14,0,1)$ lies on line ℓ_2
30 : $P_{514} = (0,15,0,1)$ lies on line ℓ_2
31 : $P_{563} = (2,2,1,1)$ lies on line ℓ_4
32 : $P_{580} = (3,3,1,1)$ lies on line ℓ_4
33 : $P_{597} = (4,4,1,1)$ lies on line ℓ_4
34 : $P_{614} = (5,5,1,1)$ lies on line ℓ_4
35 : $P_{631} = (6,6,1,1)$ lies on line ℓ_4
36 : $P_{648} = (7,7,1,1)$ lies on line ℓ_4
37 : $P_{665} = (8,8,1,1)$ lies on line ℓ_4

38 : $P_{682} = (9, 9, 1, 1)$ lies on line ℓ_4
39 : $P_{699} = (10, 10, 1, 1)$ lies on line ℓ_4
40 : $P_{716} = (11, 11, 1, 1)$ lies on line ℓ_4
41 : $P_{733} = (12, 12, 1, 1)$ lies on line ℓ_4
42 : $P_{750} = (13, 13, 1, 1)$ lies on line ℓ_4
43 : $P_{767} = (14, 14, 1, 1)$ lies on line ℓ_4
44 : $P_{784} = (15, 15, 1, 1)$ lies on line ℓ_4
45 : $P_{815} = (14, 1, 2, 1)$ lies on line ℓ_{17}
46 : $P_{822} = (5, 2, 2, 1)$ lies on line ℓ_{17}
47 : $P_{844} = (11, 3, 2, 1)$ lies on line ℓ_{17}
48 : $P_{859} = (10, 4, 2, 1)$ lies on line ℓ_{17}
49 : $P_{869} = (4, 5, 2, 1)$ lies on line ℓ_{17}
50 : $P_{896} = (15, 6, 2, 1)$ lies on line ℓ_{17}
51 : $P_{898} = (1, 7, 2, 1)$ lies on line ℓ_{17}
52 : $P_{926} = (13, 8, 2, 1)$ lies on line ℓ_{17}
53 : $P_{932} = (3, 9, 2, 1)$ lies on line ℓ_{17}
54 : $P_{953} = (8, 10, 2, 1)$ lies on line ℓ_{17}
55 : $P_{967} = (6, 11, 2, 1)$ lies on line ℓ_{17}
56 : $P_{984} = (7, 12, 2, 1)$ lies on line ℓ_{17}
57 : $P_{1002} = (9, 13, 2, 1)$ lies on line ℓ_{17}
58 : $P_{1011} = (2, 14, 2, 1)$ lies on line ℓ_{17}
59 : $P_{1037} = (12, 15, 2, 1)$ lies on line ℓ_{17}
60 : $P_{1072} = (15, 1, 3, 1)$ lies on line ℓ_{18}
61 : $P_{1080} = (7, 2, 3, 1)$ lies on line ℓ_{18}
62 : $P_{1097} = (8, 3, 3, 1)$ lies on line ℓ_{18}
63 : $P_{1119} = (14, 4, 3, 1)$ lies on line ℓ_{18}
64 : $P_{1122} = (1, 5, 3, 1)$ lies on line ℓ_{18}
65 : $P_{1146} = (9, 6, 3, 1)$ lies on line ℓ_{18}
66 : $P_{1159} = (6, 7, 3, 1)$ lies on line ℓ_{18}
67 : $P_{1174} = (5, 8, 3, 1)$ lies on line ℓ_{18}
68 : $P_{1195} = (10, 9, 3, 1)$ lies on line ℓ_{18}
69 : $P_{1203} = (2, 10, 3, 1)$ lies on line ℓ_{18}
70 : $P_{1230} = (13, 11, 3, 1)$ lies on line ℓ_{18}
71 : $P_{1244} = (11, 12, 3, 1)$ lies on line ℓ_{18}
72 : $P_{1253} = (4, 13, 3, 1)$ lies on line ℓ_{18}
73 : $P_{1277} = (12, 14, 3, 1)$ lies on line ℓ_{18}
74 : $P_{1284} = (3, 15, 3, 1)$ lies on line ℓ_{18}
75 : $P_{1315} = (2, 1, 4, 1)$ lies on line ℓ_5
76 : $P_{1333} = (4, 2, 4, 1)$ lies on line ℓ_5
77 : $P_{1351} = (6, 3, 4, 1)$ lies on line ℓ_5
78 : $P_{1369} = (8, 4, 4, 1)$ lies on line ℓ_5
79 : $P_{1387} = (10, 5, 4, 1)$ lies on line ℓ_5
80 : $P_{1405} = (12, 6, 4, 1)$ lies on line ℓ_5
81 : $P_{1423} = (14, 7, 4, 1)$ lies on line ℓ_5
82 : $P_{1434} = (9, 8, 4, 1)$ lies on line ℓ_5
83 : $P_{1452} = (11, 9, 4, 1)$ lies on line ℓ_5
84 : $P_{1470} = (13, 10, 4, 1)$ lies on line ℓ_5
85 : $P_{1488} = (15, 11, 4, 1)$ lies on line ℓ_5
86 : $P_{1490} = (1, 12, 4, 1)$ lies on line ℓ_5
87 : $P_{1508} = (3, 13, 4, 1)$ lies on line ℓ_5
88 : $P_{1526} = (5, 14, 4, 1)$ lies on line ℓ_5
89 : $P_{1544} = (7, 15, 4, 1)$ lies on line ℓ_5
90 : $P_{1572} = (3, 1, 5, 1)$ lies on line ℓ_6
91 : $P_{1591} = (6, 2, 5, 1)$ lies on line ℓ_6
92 : $P_{1606} = (5, 3, 5, 1)$ lies on line ℓ_6
93 : $P_{1629} = (12, 4, 5, 1)$ lies on line ℓ_6
94 : $P_{1648} = (15, 5, 5, 1)$ lies on line ℓ_6
95 : $P_{1659} = (10, 6, 5, 1)$ lies on line ℓ_6
96 : $P_{1674} = (9, 7, 5, 1)$ lies on line ℓ_6
97 : $P_{1682} = (1, 8, 5, 1)$ lies on line ℓ_6
98 : $P_{1699} = (2, 9, 5, 1)$ lies on line ℓ_6
99 : $P_{1720} = (7, 10, 5, 1)$ lies on line ℓ_6
100 : $P_{1733} = (4, 11, 5, 1)$ lies on line ℓ_6
101 : $P_{1758} = (13, 12, 5, 1)$ lies on line ℓ_6
102 : $P_{1775} = (14, 13, 5, 1)$ lies on line ℓ_6
103 : $P_{1788} = (11, 14, 5, 1)$ lies on line ℓ_6
104 : $P_{1801} = (8, 15, 5, 1)$ lies on line ℓ_6
105 : $P_{1837} = (12, 1, 6, 1)$ lies on line ℓ_{15}
106 : $P_{1842} = (1, 2, 6, 1)$ lies on line ℓ_{15}
107 : $P_{1870} = (13, 3, 6, 1)$ lies on line ℓ_{15}
108 : $P_{1875} = (2, 4, 6, 1)$ lies on line ℓ_{15}
109 : $P_{1903} = (14, 5, 6, 1)$ lies on line ℓ_{15}
110 : $P_{1908} = (3, 6, 6, 1)$ lies on line ℓ_{15}
111 : $P_{1936} = (15, 7, 6, 1)$ lies on line ℓ_{15}
112 : $P_{1941} = (4, 8, 6, 1)$ lies on line ℓ_{15}
113 : $P_{1961} = (8, 9, 6, 1)$ lies on line ℓ_{15}
114 : $P_{1974} = (5, 10, 6, 1)$ lies on line ℓ_{15}
115 : $P_{1994} = (9, 11, 6, 1)$ lies on line ℓ_{15}
116 : $P_{2007} = (6, 12, 6, 1)$ lies on line ℓ_{15}
117 : $P_{2027} = (10, 13, 6, 1)$ lies on line ℓ_{15}
118 : $P_{2040} = (7, 14, 6, 1)$ lies on line ℓ_{15}
119 : $P_{2060} = (11, 15, 6, 1)$ lies on line ℓ_{15}
120 : $P_{2094} = (13, 1, 7, 1)$ lies on line ℓ_{16}
121 : $P_{2100} = (3, 2, 7, 1)$ lies on line ℓ_{16}
122 : $P_{2127} = (14, 3, 7, 1)$ lies on line ℓ_{16}
123 : $P_{2135} = (6, 4, 7, 1)$ lies on line ℓ_{16}
124 : $P_{2156} = (11, 5, 7, 1)$ lies on line ℓ_{16}
125 : $P_{2166} = (5, 6, 7, 1)$ lies on line ℓ_{16}
126 : $P_{2185} = (8, 7, 7, 1)$ lies on line ℓ_{16}
127 : $P_{2205} = (12, 8, 7, 1)$ lies on line ℓ_{16}
128 : $P_{2210} = (1, 9, 7, 1)$ lies on line ℓ_{16}
129 : $P_{2240} = (15, 10, 7, 1)$ lies on line ℓ_{16}
130 : $P_{2243} = (2, 11, 7, 1)$ lies on line ℓ_{16}
131 : $P_{2267} = (10, 12, 7, 1)$ lies on line ℓ_{16}
132 : $P_{2280} = (7, 13, 7, 1)$ lies on line ℓ_{16}
133 : $P_{2298} = (9, 14, 7, 1)$ lies on line ℓ_{16}
134 : $P_{2309} = (4, 15, 7, 1)$ lies on line ℓ_{16}
135 : $P_{2342} = (5, 1, 8, 1)$ lies on line ℓ_8
136 : $P_{2363} = (10, 2, 8, 1)$ lies on line ℓ_8
137 : $P_{2384} = (15, 3, 8, 1)$ lies on line ℓ_8
138 : $P_{2398} = (13, 4, 8, 1)$ lies on line ℓ_8
139 : $P_{2409} = (8, 5, 8, 1)$ lies on line ℓ_8
140 : $P_{2424} = (7, 6, 8, 1)$ lies on line ℓ_8
141 : $P_{2435} = (2, 7, 8, 1)$ lies on line ℓ_8
142 : $P_{2452} = (3, 8, 8, 1)$ lies on line ℓ_8
143 : $P_{2471} = (6, 9, 8, 1)$ lies on line ℓ_8
144 : $P_{2490} = (9, 10, 8, 1)$ lies on line ℓ_8
145 : $P_{2509} = (12, 11, 8, 1)$ lies on line ℓ_8

146 : $P_{2527} = (14, 12, 8, 1)$ lies on line ℓ_8
147 : $P_{2540} = (11, 13, 8, 1)$ lies on line ℓ_8
148 : $P_{2549} = (4, 14, 8, 1)$ lies on line ℓ_8
149 : $P_{2562} = (1, 15, 8, 1)$ lies on line ℓ_8
150 : $P_{2597} = (4, 1, 9, 1)$ lies on line ℓ_7
151 : $P_{2617} = (8, 2, 9, 1)$ lies on line ℓ_7
152 : $P_{2637} = (12, 3, 9, 1)$ lies on line ℓ_7
153 : $P_{2650} = (9, 4, 9, 1)$ lies on line ℓ_7
154 : $P_{2670} = (13, 5, 9, 1)$ lies on line ℓ_7
155 : $P_{2674} = (1, 6, 9, 1)$ lies on line ℓ_7
156 : $P_{2694} = (5, 7, 9, 1)$ lies on line ℓ_7
157 : $P_{2716} = (11, 8, 9, 1)$ lies on line ℓ_7
158 : $P_{2736} = (15, 9, 9, 1)$ lies on line ℓ_7
159 : $P_{2740} = (3, 10, 9, 1)$ lies on line ℓ_7
160 : $P_{2760} = (7, 11, 9, 1)$ lies on line ℓ_7
161 : $P_{2771} = (2, 12, 9, 1)$ lies on line ℓ_7
162 : $P_{2791} = (6, 13, 9, 1)$ lies on line ℓ_7
163 : $P_{2811} = (10, 14, 9, 1)$ lies on line ℓ_7
164 : $P_{2831} = (14, 15, 9, 1)$ lies on line ℓ_7
165 : $P_{2860} = (11, 1, 10, 1)$ lies on line ℓ_{14}
166 : $P_{2880} = (15, 2, 10, 1)$ lies on line ℓ_{14}
167 : $P_{2885} = (4, 3, 10, 1)$ lies on line ℓ_{14}
168 : $P_{2904} = (7, 4, 10, 1)$ lies on line ℓ_{14}
169 : $P_{2925} = (12, 5, 10, 1)$ lies on line ℓ_{14}
170 : $P_{2937} = (8, 6, 10, 1)$ lies on line ℓ_{14}
171 : $P_{2948} = (3, 7, 10, 1)$ lies on line ℓ_{14}
172 : $P_{2975} = (14, 8, 10, 1)$ lies on line ℓ_{14}
173 : $P_{2982} = (5, 9, 10, 1)$ lies on line ℓ_{14}
174 : $P_{2994} = (1, 10, 10, 1)$ lies on line ℓ_{14}
175 : $P_{3019} = (10, 11, 10, 1)$ lies on line ℓ_{14}
176 : $P_{3034} = (9, 12, 10, 1)$ lies on line ℓ_{14}
177 : $P_{3043} = (2, 13, 10, 1)$ lies on line ℓ_{14}
178 : $P_{3063} = (6, 14, 10, 1)$ lies on line ℓ_{14}
179 : $P_{3086} = (13, 15, 10, 1)$ lies on line ℓ_{14}
180 : $P_{3115} = (10, 1, 11, 1)$ lies on line ℓ_{13}
181 : $P_{3134} = (13, 2, 11, 1)$ lies on line ℓ_{13}
182 : $P_{3144} = (7, 3, 11, 1)$ lies on line ℓ_{13}
183 : $P_{3156} = (3, 4, 11, 1)$ lies on line ℓ_{13}
184 : $P_{3178} = (9, 5, 11, 1)$ lies on line ℓ_{13}
185 : $P_{3199} = (14, 6, 11, 1)$ lies on line ℓ_{13}
186 : $P_{3205} = (4, 7, 11, 1)$ lies on line ℓ_{13}
187 : $P_{3223} = (6, 8, 11, 1)$ lies on line ℓ_{13}
188 : $P_{3245} = (12, 9, 11, 1)$ lies on line ℓ_{13}
189 : $P_{3260} = (11, 10, 11, 1)$ lies on line ℓ_{13}
190 : $P_{3266} = (1, 11, 11, 1)$ lies on line ℓ_{13}
191 : $P_{3286} = (5, 12, 11, 1)$ lies on line ℓ_{13}
192 : $P_{3312} = (15, 13, 11, 1)$ lies on line ℓ_{13}
193 : $P_{3321} = (8, 14, 11, 1)$ lies on line ℓ_{13}
194 : $P_{3331} = (2, 15, 11, 1)$ lies on line ℓ_{13}
195 : $P_{3368} = (7, 1, 12, 1)$ lies on line ℓ_{10}
196 : $P_{3391} = (14, 2, 12, 1)$ lies on line ℓ_{10}
197 : $P_{3402} = (9, 3, 12, 1)$ lies on line ℓ_{10}
198 : $P_{3414} = (5, 4, 12, 1)$ lies on line ℓ_{10}
199 : $P_{3427} = (2, 5, 12, 1)$ lies on line ℓ_{10}
200 : $P_{3452} = (11, 6, 12, 1)$ lies on line ℓ_{10}
201 : $P_{3469} = (12, 7, 12, 1)$ lies on line ℓ_{10}
202 : $P_{3483} = (10, 8, 12, 1)$ lies on line ℓ_{10}
203 : $P_{3502} = (13, 9, 12, 1)$ lies on line ℓ_{10}
204 : $P_{3509} = (4, 10, 12, 1)$ lies on line ℓ_{10}
205 : $P_{3524} = (3, 11, 12, 1)$ lies on line ℓ_{10}
206 : $P_{3552} = (15, 12, 12, 1)$ lies on line ℓ_{10}
207 : $P_{3561} = (8, 13, 12, 1)$ lies on line ℓ_{10}
208 : $P_{3570} = (1, 14, 12, 1)$ lies on line ℓ_{10}
209 : $P_{3591} = (6, 15, 12, 1)$ lies on line ℓ_{10}
210 : $P_{3623} = (6, 1, 13, 1)$ lies on line ℓ_9
211 : $P_{3645} = (12, 2, 13, 1)$ lies on line ℓ_9
212 : $P_{3659} = (10, 3, 13, 1)$ lies on line ℓ_9
213 : $P_{3666} = (1, 4, 13, 1)$ lies on line ℓ_9
214 : $P_{3688} = (7, 5, 13, 1)$ lies on line ℓ_9
215 : $P_{3710} = (13, 6, 13, 1)$ lies on line ℓ_9
216 : $P_{3724} = (11, 7, 13, 1)$ lies on line ℓ_9
217 : $P_{3731} = (2, 8, 13, 1)$ lies on line ℓ_9
218 : $P_{3749} = (4, 9, 13, 1)$ lies on line ℓ_9
219 : $P_{3775} = (14, 10, 13, 1)$ lies on line ℓ_9
220 : $P_{3785} = (8, 11, 13, 1)$ lies on line ℓ_9
221 : $P_{3796} = (3, 12, 13, 1)$ lies on line ℓ_9
222 : $P_{3814} = (5, 13, 13, 1)$ lies on line ℓ_9
223 : $P_{3840} = (15, 14, 13, 1)$ lies on line ℓ_9
224 : $P_{3850} = (9, 15, 13, 1)$ lies on line ℓ_9
225 : $P_{3882} = (9, 1, 14, 1)$ lies on line ℓ_{12}
226 : $P_{3900} = (11, 2, 14, 1)$ lies on line ℓ_{12}
227 : $P_{3907} = (2, 3, 14, 1)$ lies on line ℓ_{12}
228 : $P_{3936} = (15, 4, 14, 1)$ lies on line ℓ_{12}
229 : $P_{3943} = (6, 5, 14, 1)$ lies on line ℓ_{12}
230 : $P_{3957} = (4, 6, 14, 1)$ lies on line ℓ_{12}
231 : $P_{3982} = (13, 7, 14, 1)$ lies on line ℓ_{12}
232 : $P_{3992} = (7, 8, 14, 1)$ lies on line ℓ_{12}
233 : $P_{4015} = (14, 9, 14, 1)$ lies on line ℓ_{12}
234 : $P_{4029} = (12, 10, 14, 1)$ lies on line ℓ_{12}
235 : $P_{4038} = (5, 11, 14, 1)$ lies on line ℓ_{12}
236 : $P_{4057} = (8, 12, 14, 1)$ lies on line ℓ_{12}
237 : $P_{4066} = (1, 13, 14, 1)$ lies on line ℓ_{12}
238 : $P_{4084} = (3, 14, 14, 1)$ lies on line ℓ_{12}
239 : $P_{4107} = (10, 15, 14, 1)$ lies on line ℓ_{12}
240 : $P_{4137} = (8, 1, 15, 1)$ lies on line ℓ_{11}
241 : $P_{4154} = (9, 2, 15, 1)$ lies on line ℓ_{11}
242 : $P_{4162} = (1, 3, 15, 1)$ lies on line ℓ_{11}
243 : $P_{4188} = (11, 4, 15, 1)$ lies on line ℓ_{11}
244 : $P_{4196} = (3, 5, 15, 1)$ lies on line ℓ_{11}
245 : $P_{4211} = (2, 6, 15, 1)$ lies on line ℓ_{11}
246 : $P_{4235} = (10, 7, 15, 1)$ lies on line ℓ_{11}
247 : $P_{4256} = (15, 8, 15, 1)$ lies on line ℓ_{11}
248 : $P_{4264} = (7, 9, 15, 1)$ lies on line ℓ_{11}
249 : $P_{4279} = (6, 10, 15, 1)$ lies on line ℓ_{11}
250 : $P_{4303} = (14, 11, 15, 1)$ lies on line ℓ_{11}
251 : $P_{4309} = (4, 12, 15, 1)$ lies on line ℓ_{11}
252 : $P_{4333} = (12, 13, 15, 1)$ lies on line ℓ_{11}
253 : $P_{4350} = (13, 14, 15, 1)$ lies on line ℓ_{11}
254 : $P_{4358} = (5, 15, 15, 1)$ lies on line ℓ_{11}

The single points on the surface are:

Points on surface but on no line

The surface has 0 points not on any line:
The points on the surface but not on lines are:

Line Intersection Graph

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

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}
in point	P_0	P_1	P_5	P_6	P_7	P_8	P_9	P_{10}	P_{11}	P_{12}	P_{13}	P_{14}	P_{15}	P_{16}	P_{17}	P_{18}	P_{19}

Line 1 intersects

Line	ℓ_0	ℓ_3
in point	P_0	P_2

Line 2 intersects

Line	ℓ_0	ℓ_3
in point	P_1	P_3

Line 3 intersects

Line	ℓ_1	ℓ_2	ℓ_4	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}
in point	P_2	P_3	P_{530}	P_{1297}	P_{1553}	P_{2577}	P_{2321}	P_{3601}	P_{3345}	P_{4113}	P_{3857}	P_{3089}	P_{2833}	P_{1809}	P_{2065}	P_{785}

Line 4 intersects

Line	ℓ_0	ℓ_3
in point	P_5	P_{530}

Line 5 intersects

Line	ℓ_0	ℓ_3
in point	P_6	P_{1297}

Line 6 intersects

Line	ℓ_0	ℓ_3
in point	P_7	P_{1553}

Line 7 intersects

Line	ℓ_0	ℓ_3
in point	P_8	P_{2577}

Line 8 intersects

Line	ℓ_0	ℓ_3
in point	P_9	P_{2321}

Line 9 intersects

Line	ℓ_0	ℓ_3
in point	P_{10}	P_{3601}

Line 10 intersects

Line	ℓ_0	ℓ_3
in point	P_{11}	P_{3345}

Line 11 intersects

Line	ℓ_0	ℓ_3
in point	P_{12}	P_{4113}

Line 12 intersects

Line	ℓ_0	ℓ_3
in point	P_{13}	P_{3857}

Line 13 intersects

Line	ℓ_0	ℓ_3
in point	P_{14}	P_{3089}

Line 14 intersects

Line	ℓ_0	ℓ_3
in point	P_{15}	P_{2833}

Line 15 intersects

Line	ℓ_0	ℓ_3
in point	P_{16}	P_{1809}

Line 16 intersects

Line	ℓ_0	ℓ_3
in point	P_{17}	P_{2065}

Line 17 intersects

Line	ℓ_0	ℓ_3
in point	P_{18}	P_{785}

Line 18 intersects

Line	ℓ_0	ℓ_3
in point	P_{19}	P_{1041}

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

$0: P_0 = (1,0,0,0)$
$1: P_1 = (0,1,0,0)$
$2: P_2 = (0,0,1,0)$
$3: P_3 = (0,0,0,1)$
$4: P_4 = (1,1,1,1)$
$5: P_5 = (1,1,0,0)$
$6: P_6 = (2,1,0,0)$
$7: P_7 = (3,1,0,0)$
$8: P_8 = (4,1,0,0)$
$9: P_9 = (5,1,0,0)$
$10: P_{10} = (6,1,0,0)$
$11: P_{11} = (7,1,0,0)$
$12: P_{12} = (8,1,0,0)$
$13: P_{13} = (9,1,0,0)$
$14: P_{14} = (10,1,0,0)$
$15: P_{15} = (11,1,0,0)$
$16: P_{16} = (12,1,0,0)$
$17: P_{17} = (13,1,0,0)$

$18: P_{18} = (14, 1, 0, 0)$
$19: P_{19} = (15, 1, 0, 0)$
$20: P_{20} = (1, 0, 1, 0)$
$21: P_{21} = (2, 0, 1, 0)$
$22: P_{22} = (3, 0, 1, 0)$
$23: P_{23} = (4, 0, 1, 0)$
$24: P_{24} = (5, 0, 1, 0)$
$25: P_{25} = (6, 0, 1, 0)$
$26: P_{26} = (7, 0, 1, 0)$
$27: P_{27} = (8, 0, 1, 0)$
$28: P_{28} = (9, 0, 1, 0)$
$29: P_{29} = (10, 0, 1, 0)$
$30: P_{30} = (11, 0, 1, 0)$
$31: P_{31} = (12, 0, 1, 0)$
$32: P_{32} = (13, 0, 1, 0)$
$33: P_{33} = (14, 0, 1, 0)$
$34: P_{34} = (15, 0, 1, 0)$
$35: P_{290} = (0, 1, 0, 1)$
$36: P_{306} = (0, 2, 0, 1)$
$37: P_{322} = (0, 3, 0, 1)$
$38: P_{338} = (0, 4, 0, 1)$
$39: P_{354} = (0, 5, 0, 1)$
$40: P_{370} = (0, 6, 0, 1)$
$41: P_{386} = (0, 7, 0, 1)$
$42: P_{402} = (0, 8, 0, 1)$
$43: P_{418} = (0, 9, 0, 1)$
$44: P_{434} = (0, 10, 0, 1)$
$45: P_{450} = (0, 11, 0, 1)$
$46: P_{466} = (0, 12, 0, 1)$
$47: P_{482} = (0, 13, 0, 1)$
$48: P_{498} = (0, 14, 0, 1)$
$49: P_{514} = (0, 15, 0, 1)$
$50: P_{530} = (0, 0, 1, 1)$
$51: P_{563} = (2, 2, 1, 1)$
$52: P_{580} = (3, 3, 1, 1)$
$53: P_{597} = (4, 4, 1, 1)$
$54: P_{614} = (5, 5, 1, 1)$
$55: P_{631} = (6, 6, 1, 1)$
$56: P_{648} = (7, 7, 1, 1)$
$57: P_{665} = (8, 8, 1, 1)$
$58: P_{682} = (9, 9, 1, 1)$
$59: P_{699} = (10, 10, 1, 1)$
$60: P_{716} = (11, 11, 1, 1)$
$61: P_{733} = (12, 12, 1, 1)$
$62: P_{750} = (13, 13, 1, 1)$
$63: P_{767} = (14, 14, 1, 1)$
$64: P_{784} = (15, 15, 1, 1)$
$65: P_{785} = (0, 0, 2, 1)$
$66: P_{815} = (14, 1, 2, 1)$
$67: P_{822} = (5, 2, 2, 1)$
$68: P_{844} = (11, 3, 2, 1)$
$69: P_{859} = (10, 4, 2, 1)$
$70: P_{869} = (4, 5, 2, 1)$
$71: P_{896} = (15, 6, 2, 1)$
$72: P_{898} = (1, 7, 2, 1)$
$73: P_{926} = (13, 8, 2, 1)$
$74: P_{932} = (3, 9, 2, 1)$
$75: P_{953} = (8, 10, 2, 1)$
$76: P_{967} = (6, 11, 2, 1)$
$77: P_{984} = (7, 12, 2, 1)$
$78: P_{1002} = (9, 13, 2, 1)$
$79: P_{1011} = (2, 14, 2, 1)$
$80: P_{1037} = (12, 15, 2, 1)$
$81: P_{1041} = (0, 0, 3, 1)$
$82: P_{1072} = (15, 1, 3, 1)$
$83: P_{1080} = (7, 2, 3, 1)$
$84: P_{1097} = (8, 3, 3, 1)$
$85: P_{1119} = (14, 4, 3, 1)$
$86: P_{1122} = (1, 5, 3, 1)$
$87: P_{1146} = (9, 6, 3, 1)$
$88: P_{1159} = (6, 7, 3, 1)$
$89: P_{1174} = (5, 8, 3, 1)$
$90: P_{1195} = (10, 9, 3, 1)$
$91: P_{1203} = (2, 10, 3, 1)$
$92: P_{1230} = (13, 11, 3, 1)$
$93: P_{1244} = (11, 12, 3, 1)$
$94: P_{1253} = (4, 13, 3, 1)$
$95: P_{1277} = (12, 14, 3, 1)$
$96: P_{1284} = (3, 15, 3, 1)$
$97: P_{1297} = (0, 0, 4, 1)$
$98: P_{1315} = (2, 1, 4, 1)$
$99: P_{1333} = (4, 2, 4, 1)$
$100: P_{1351} = (6, 3, 4, 1)$
$101: P_{1369} = (8, 4, 4, 1)$
$102: P_{1387} = (10, 5, 4, 1)$
$103: P_{1405} = (12, 6, 4, 1)$
$104: P_{1423} = (14, 7, 4, 1)$
$105: P_{1434} = (9, 8, 4, 1)$
$106: P_{1452} = (11, 9, 4, 1)$
$107: P_{1470} = (13, 10, 4, 1)$
$108: P_{1488} = (15, 11, 4, 1)$
$109: P_{1490} = (1, 12, 4, 1)$
$110: P_{1508} = (3, 13, 4, 1)$
$111: P_{1526} = (5, 14, 4, 1)$
$112: P_{1544} = (7, 15, 4, 1)$
$113: P_{1553} = (0, 0, 5, 1)$
$114: P_{1572} = (3, 1, 5, 1)$
$115: P_{1591} = (6, 2, 5, 1)$
$116: P_{1606} = (5, 3, 5, 1)$
$117: P_{1629} = (12, 4, 5, 1)$
$118: P_{1648} = (15, 5, 5, 1)$
$119: P_{1659} = (10, 6, 5, 1)$
$120: P_{1674} = (9, 7, 5, 1)$
$121: P_{1682} = (1, 8, 5, 1)$
$122: P_{1699} = (2, 9, 5, 1)$
$123: P_{1720} = (7, 10, 5, 1)$
$124: P_{1733} = (4, 11, 5, 1)$
$125: P_{1758} = (13, 12, 5, 1)$
$126: P_{1775} = (14, 13, 5, 1)$
$127: P_{1788} = (11, 14, 5, 1)$
$128: P_{1801} = (8, 15, 5, 1)$
$129: P_{1809} = (0, 0, 6, 1)$
$130: P_{1837} = (12, 1, 6, 1)$
$131: P_{1842} = (1, 2, 6, 1)$
$132: P_{1870} = (13, 3, 6, 1)$
$133: P_{1875} = (2, 4, 6, 1)$
$134: P_{1903} = (14, 5, 6, 1)$
$135: P_{1908} = (3, 6, 6, 1)$
$136: P_{1936} = (15, 7, 6, 1)$
$137: P_{1941} = (4, 8, 6, 1)$
$138: P_{1961} = (8, 9, 6, 1)$
$139: P_{1974} = (5, 10, 6, 1)$
$140: P_{1994} = (9, 11, 6, 1)$
$141: P_{2007} = (6, 12, 6, 1)$
$142: P_{2027} = (10, 13, 6, 1)$
$143: P_{2040} = (7, 14, 6, 1)$
$144: P_{2060} = (11, 15, 6, 1)$
$145: P_{2065} = (0, 0, 7, 1)$
$146: P_{2094} = (13, 1, 7, 1)$
$147: P_{2100} = (3, 2, 7, 1)$
$148: P_{2127} = (14, 3, 7, 1)$
$149: P_{2135} = (6, 4, 7, 1)$
$150: P_{2156} = (11, 5, 7, 1)$
$151: P_{2166} = (5, 6, 7, 1)$
$152: P_{2185} = (8, 7, 7, 1)$
$153: P_{2205} = (12, 8, 7, 1)$
$154: P_{2210} = (1, 9, 7, 1)$
$155: P_{2240} = (15, 10, 7, 1)$
$156: P_{2243} = (2, 11, 7, 1)$
$157: P_{2267} = (10, 12, 7, 1)$
$158: P_{2280} = (7, 13, 7, 1)$
$159: P_{2298} = (9, 14, 7, 1)$
$160: P_{2309} = (4, 15, 7, 1)$
$161: P_{2321} = (0, 0, 8, 1)$
$162: P_{2342} = (5, 1, 8, 1)$
$163: P_{2363} = (10, 2, 8, 1)$
$164: P_{2384} = (15, 3, 8, 1)$
$165: P_{2398} = (13, 4, 8, 1)$
$166: P_{2409} = (8, 5, 8, 1)$
$167: P_{2424} = (7, 6, 8, 1)$
$168: P_{2435} = (2, 7, 8, 1)$
$169: P_{2452} = (3, 8, 8, 1)$
$170: P_{2471} = (6, 9, 8, 1)$
$171: P_{2490} = (9, 10, 8, 1)$
$172: P_{2509} = (12, 11, 8, 1)$
$173: P_{2527} = (14, 12, 8, 1)$
$174: P_{2540} = (11, 13, 8, 1)$
$175: P_{2549} = (4, 14, 8, 1)$
$176: P_{2562} = (1, 15, 8, 1)$
$177: P_{2577} = (0, 0, 9, 1)$
$178: P_{2597} = (4, 1, 9, 1)$
$179: P_{2617} = (8, 2, 9, 1)$

$180: P_{2637} = (12, 3, 9, 1)$
$181: P_{2650} = (9, 4, 9, 1)$
$182: P_{2670} = (13, 5, 9, 1)$
$183: P_{2674} = (1, 6, 9, 1)$
$184: P_{2694} = (5, 7, 9, 1)$
$185: P_{2716} = (11, 8, 9, 1)$
$186: P_{2736} = (15, 9, 9, 1)$
$187: P_{2740} = (3, 10, 9, 1)$
$188: P_{2760} = (7, 11, 9, 1)$
$189: P_{2771} = (2, 12, 9, 1)$
$190: P_{2791} = (6, 13, 9, 1)$
$191: P_{2811} = (10, 14, 9, 1)$
$192: P_{2831} = (14, 15, 9, 1)$
$193: P_{2833} = (0, 0, 10, 1)$
$194: P_{2860} = (11, 1, 10, 1)$
$195: P_{2880} = (15, 2, 10, 1)$
$196: P_{2885} = (4, 3, 10, 1)$
$197: P_{2904} = (7, 4, 10, 1)$
$198: P_{2925} = (12, 5, 10, 1)$
$199: P_{2937} = (8, 6, 10, 1)$
$200: P_{2948} = (3, 7, 10, 1)$
$201: P_{2975} = (14, 8, 10, 1)$
$202: P_{2982} = (5, 9, 10, 1)$
$203: P_{2994} = (1, 10, 10, 1)$
$204: P_{3019} = (10, 11, 10, 1)$
$205: P_{3034} = (9, 12, 10, 1)$
$206: P_{3043} = (2, 13, 10, 1)$
$207: P_{3063} = (6, 14, 10, 1)$
$208: P_{3086} = (13, 15, 10, 1)$
$209: P_{3089} = (0, 0, 11, 1)$
$210: P_{3115} = (10, 1, 11, 1)$
$211: P_{3134} = (13, 2, 11, 1)$
$212: P_{3144} = (7, 3, 11, 1)$
$213: P_{3156} = (3, 4, 11, 1)$
$214: P_{3178} = (9, 5, 11, 1)$
$215: P_{3199} = (14, 6, 11, 1)$
$216: P_{3205} = (4, 7, 11, 1)$
$217: P_{3223} = (6, 8, 11, 1)$
$218: P_{3245} = (12, 9, 11, 1)$
$219: P_{3260} = (11, 10, 11, 1)$
$220: P_{3266} = (1, 11, 11, 1)$
$221: P_{3286} = (5, 12, 11, 1)$
$222: P_{3312} = (15, 13, 11, 1)$
$223: P_{3321} = (8, 14, 11, 1)$
$224: P_{3331} = (2, 15, 11, 1)$
$225: P_{3345} = (0, 0, 12, 1)$
$226: P_{3368} = (7, 1, 12, 1)$
$227: P_{3391} = (14, 2, 12, 1)$
$228: P_{3402} = (9, 3, 12, 1)$
$229: P_{3414} = (5, 4, 12, 1)$
$230: P_{3427} = (2, 5, 12, 1)$
$231: P_{3452} = (11, 6, 12, 1)$
$232: P_{3469} = (12, 7, 12, 1)$
$233: P_{3483} = (10, 8, 12, 1)$
$234: P_{3502} = (13, 9, 12, 1)$
$235: P_{3509} = (4, 10, 12, 1)$
$236: P_{3524} = (3, 11, 12, 1)$
$237: P_{3552} = (15, 12, 12, 1)$
$238: P_{3561} = (8, 13, 12, 1)$
$239: P_{3570} = (1, 14, 12, 1)$
$240: P_{3591} = (6, 15, 12, 1)$
$241: P_{3601} = (0, 0, 13, 1)$
$242: P_{3623} = (6, 1, 13, 1)$
$243: P_{3645} = (12, 2, 13, 1)$
$244: P_{3659} = (10, 3, 13, 1)$
$245: P_{3666} = (1, 4, 13, 1)$
$246: P_{3688} = (7, 5, 13, 1)$
$247: P_{3710} = (13, 6, 13, 1)$
$248: P_{3724} = (11, 7, 13, 1)$
$249: P_{3731} = (2, 8, 13, 1)$
$250: P_{3749} = (4, 9, 13, 1)$
$251: P_{3775} = (14, 10, 13, 1)$
$252: P_{3785} = (8, 11, 13, 1)$
$253: P_{3796} = (3, 12, 13, 1)$
$254: P_{3814} = (5, 13, 13, 1)$
$255: P_{3840} = (15, 14, 13, 1)$
$256: P_{3850} = (9, 15, 13, 1)$
$257: P_{3857} = (0, 0, 14, 1)$
$258: P_{3882} = (9, 1, 14, 1)$
$259: P_{3900} = (11, 2, 14, 1)$
$260: P_{3907} = (2, 3, 14, 1)$
$261: P_{3936} = (15, 4, 14, 1)$
$262: P_{3943} = (6, 5, 14, 1)$
$263: P_{3957} = (4, 6, 14, 1)$
$264: P_{3982} = (13, 7, 14, 1)$
$265: P_{3992} = (7, 8, 14, 1)$
$266: P_{4015} = (14, 9, 14, 1)$
$267: P_{4029} = (12, 10, 14, 1)$
$268: P_{4038} = (5, 11, 14, 1)$
$269: P_{4057} = (8, 12, 14, 1)$
$270: P_{4066} = (1, 13, 14, 1)$
$271: P_{4084} = (3, 14, 14, 1)$
$272: P_{4107} = (10, 15, 14, 1)$
$273: P_{4113} = (0, 0, 15, 1)$
$274: P_{4137} = (8, 1, 15, 1)$
$275: P_{4154} = (9, 2, 15, 1)$
$276: P_{4162} = (1, 3, 15, 1)$
$277: P_{4188} = (11, 4, 15, 1)$
$278: P_{4196} = (3, 5, 15, 1)$
$279: P_{4211} = (2, 6, 15, 1)$
$280: P_{4235} = (10, 7, 15, 1)$
$281: P_{4256} = (15, 8, 15, 1)$
$282: P_{4264} = (7, 9, 15, 1)$
$283: P_{4279} = (6, 10, 15, 1)$
$284: P_{4303} = (14, 11, 15, 1)$
$285: P_{4309} = (4, 12, 15, 1)$
$286: P_{4333} = (12, 13, 15, 1)$
$287: P_{4350} = (13, 14, 15, 1)$
$288: P_{4358} = (5, 15, 15, 1)$