Rank-65609 over GF(16)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(16) is 303108645

General information

Number of lines	6
Number of points	305
Number of singular points	1
Number of Eckardt points	1
Number of double points	6
Number of single points	87
Number of points off lines	211
Number of Hesse planes	0
Number of axes	0
Type of points on lines	17^6
Type of lines on points	3, 2^6, 1^{87}, 0^{211}

Singular Points

The surface has 1 singular points:

$0: \ P_3 = \mathbf{P}(0,0,0,1) = \mathbf{P}(0,0,0,1)$

The 6 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{69921} = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{69921} = \mathbf{Pl}(0,1,0,1,0,0)_{49}$$

$$\ell_1 = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{4642} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{4642} = \mathbf{Pl}(1,1,1,1,0,1)_{5586}$$

$$\ell_2 = \left[\begin{array}{cccc} 0 & 1 & \delta^5 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{70091} = \left[\begin{array}{cccc} 0 & 1 & 11 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{70091} = \mathbf{Pl}(0,11,0,1,0,0)_{59}$$

$$\ell_3 = \left[\begin{array}{cccc} 1 & 0 & \delta^{10} & 1 \\ 0 & 1 & \delta^5 & 0 \end{array}\right]_{7109} = \left[\begin{array}{cccc} 1 & 0 & 10 & 1 \\ 0 & 1 & 11 & 0 \end{array}\right]_{7109} = \mathbf{Pl}(11,10,10,11,0,1)_{7981}$$

$$\ell_4 = \left[\begin{array}{cccc} 0 & 1 & \delta^{10} & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{70074} = \left[\begin{array}{cccc} 0 & 1 & 10 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{70074} = \mathbf{Pl}(0,10,0,1,0,0)_{58}$$

$$\ell_5 = \left[\begin{array}{cccc} 1 & 0 & \delta^5 & 1 \\ 0 & 1 & \delta^{10} & 0 \end{array}\right]_{7381} = \left[\begin{array}{cccc} 1 & 0 & 11 & 1 \\ 0 & 1 & 10 & 0 \end{array}\right]_{7381} = \mathbf{Pl}(10,11,11,10,0,1)_{7770}$$

Rank of lines: (69921, 4642, 70091, 7109, 70074, 7381)
Rank of points on Klein quadric: (49, 5586, 59, 7981, 58, 7770)

Eckardt Points

The surface has 1 Eckardt points:
$0 : P_3 = \mathbf{P}(0,0,0,1) = \mathbf{P}(0,0,0,1)$.

Double Points

The surface has 6 Double points:
The double points on the surface are:

$P_{35} = (0,1,1,0) = \ell_0 \cap \ell_1$
$P_{3250} = (1,10,11,1) = \ell_1 \cap \ell_3$
$P_{3010} = (1,11,10,1) = \ell_1 \cap \ell_5$
$P_{179} = (0,10,1,0) = \ell_2 \cap \ell_3$
$P_4 = (1,1,1,1) = \ell_3 \cap \ell_5$
$P_{195} = (0,11,1,0) = \ell_4 \cap \ell_5$

Single Points

The surface has 87 single points:
The single points on the surface are:

0 : $P_{291} = (1,1,0,1)$ lies on line ℓ_1
1 : $P_{435} = (1,10,0,1)$ lies on line ℓ_5
2 : $P_{451} = (1,11,0,1)$ lies on line ℓ_3
3 : $P_{531} = (1,0,1,1)$ lies on line ℓ_1
4 : $P_{546} = (0,1,1,1)$ lies on line ℓ_0
5 : $P_{689} = (0,10,1,1)$ lies on line ℓ_2
6 : $P_{705} = (0,11,1,1)$ lies on line ℓ_4
7 : $P_{817} = (0,2,2,1)$ lies on line ℓ_0
8 : $P_{834} = (1,3,2,1)$ lies on line ℓ_1
9 : $P_{866} = (1,5,2,1)$ lies on line ℓ_5
10 : $P_{882} = (1,6,2,1)$ lies on line ℓ_3
11 : $P_{993} = (0,13,2,1)$ lies on line ℓ_2
12 : $P_{1025} = (0,15,2,1)$ lies on line ℓ_4
13 : $P_{1074} = (1,2,3,1)$ lies on line ℓ_1
14 : $P_{1089} = (0,3,3,1)$ lies on line ℓ_0
15 : $P_{1105} = (0,4,3,1)$ lies on line ℓ_4
16 : $P_{1153} = (0,7,3,1)$ lies on line ℓ_2
17 : $P_{1234} = (1,12,3,1)$ lies on line ℓ_3
18 : $P_{1266} = (1,14,3,1)$ lies on line ℓ_5
19 : $P_{1345} = (0,3,4,1)$ lies on line ℓ_2
20 : $P_{1361} = (0,4,4,1)$ lies on line ℓ_0
21 : $P_{1378} = (1,5,4,1)$ lies on line ℓ_1
22 : $P_{1409} = (0,7,4,1)$ lies on line ℓ_4
23 : $P_{1426} = (1,8,4,1)$ lies on line ℓ_3
24 : $P_{1506} = (1,13,4,1)$ lies on line ℓ_5
25 : $P_{1586} = (1,2,5,1)$ lies on line ℓ_3
26 : $P_{1618} = (1,4,5,1)$ lies on line ℓ_1
27 : $P_{1633} = (0,5,5,1)$ lies on line ℓ_0
28 : $P_{1650} = (1,6,5,1)$ lies on line ℓ_5
29 : $P_{1697} = (0,9,5,1)$ lies on line ℓ_2
30 : $P_{1745} = (0,12,5,1)$ lies on line ℓ_4
31 : $P_{1842} = (1,2,6,1)$ lies on line ℓ_5
32 : $P_{1890} = (1,5,6,1)$ lies on line ℓ_3
33 : $P_{1905} = (0,6,6,1)$ lies on line ℓ_0

34 : $P_{1922} = (1, 7, 6, 1)$ lies on line ℓ_1
35 : $P_{1937} = (0, 8, 6, 1)$ lies on line ℓ_4
36 : $P_{2033} = (0, 14, 6, 1)$ lies on line ℓ_2
37 : $P_{2113} = (0, 3, 7, 1)$ lies on line ℓ_4
38 : $P_{2129} = (0, 4, 7, 1)$ lies on line ℓ_2
39 : $P_{2162} = (1, 6, 7, 1)$ lies on line ℓ_1
40 : $P_{2177} = (0, 7, 7, 1)$ lies on line ℓ_0
41 : $P_{2210} = (1, 9, 7, 1)$ lies on line ℓ_5
42 : $P_{2306} = (1, 15, 7, 1)$ lies on line ℓ_3
43 : $P_{2386} = (1, 4, 8, 1)$ lies on line ℓ_5
44 : $P_{2417} = (0, 6, 8, 1)$ lies on line ℓ_2
45 : $P_{2449} = (0, 8, 8, 1)$ lies on line ℓ_0
46 : $P_{2466} = (1, 9, 8, 1)$ lies on line ℓ_1
47 : $P_{2530} = (1, 13, 8, 1)$ lies on line ℓ_3
48 : $P_{2545} = (0, 14, 8, 1)$ lies on line ℓ_4
49 : $P_{2657} = (0, 5, 9, 1)$ lies on line ℓ_4
50 : $P_{2690} = (1, 7, 9, 1)$ lies on line ℓ_3
51 : $P_{2706} = (1, 8, 9, 1)$ lies on line ℓ_1
52 : $P_{2721} = (0, 9, 9, 1)$ lies on line ℓ_0
53 : $P_{2769} = (0, 12, 9, 1)$ lies on line ℓ_2
54 : $P_{2818} = (1, 15, 9, 1)$ lies on line ℓ_5
55 : $P_{2834} = (1, 0, 10, 1)$ lies on line ℓ_3
56 : $P_{2849} = (0, 1, 10, 1)$ lies on line ℓ_4
57 : $P_{2993} = (0, 10, 10, 1)$ lies on line ℓ_0
58 : $P_{3009} = (0, 11, 10, 1)$ lies on line ℓ_2
59 : $P_{3090} = (1, 0, 11, 1)$ lies on line ℓ_5
60 : $P_{3105} = (0, 1, 11, 1)$ lies on line ℓ_2
61 : $P_{3249} = (0, 10, 11, 1)$ lies on line ℓ_4
62 : $P_{3265} = (0, 11, 11, 1)$ lies on line ℓ_0
63 : $P_{3394} = (1, 3, 12, 1)$ lies on line ℓ_5
64 : $P_{3425} = (0, 5, 12, 1)$ lies on line ℓ_2
65 : $P_{3489} = (0, 9, 12, 1)$ lies on line ℓ_4
66 : $P_{3537} = (0, 12, 12, 1)$ lies on line ℓ_0
67 : $P_{3554} = (1, 13, 12, 1)$ lies on line ℓ_1
68 : $P_{3570} = (1, 14, 12, 1)$ lies on line ℓ_3
69 : $P_{3633} = (0, 2, 13, 1)$ lies on line ℓ_4
70 : $P_{3666} = (1, 4, 13, 1)$ lies on line ℓ_3
71 : $P_{3730} = (1, 8, 13, 1)$ lies on line ℓ_5
72 : $P_{3794} = (1, 12, 13, 1)$ lies on line ℓ_1
73 : $P_{3809} = (0, 13, 13, 1)$ lies on line ℓ_0
74 : $P_{3841} = (0, 15, 13, 1)$ lies on line ℓ_2
75 : $P_{3906} = (1, 3, 14, 1)$ lies on line ℓ_3
76 : $P_{3953} = (0, 6, 14, 1)$ lies on line ℓ_4
77 : $P_{3985} = (0, 8, 14, 1)$ lies on line ℓ_2
78 : $P_{4050} = (1, 12, 14, 1)$ lies on line ℓ_5
79 : $P_{4081} = (0, 14, 14, 1)$ lies on line ℓ_0
80 : $P_{4098} = (1, 15, 14, 1)$ lies on line ℓ_1
81 : $P_{4145} = (0, 2, 15, 1)$ lies on line ℓ_2
82 : $P_{4226} = (1, 7, 15, 1)$ lies on line ℓ_5
83 : $P_{4258} = (1, 9, 15, 1)$ lies on line ℓ_3
84 : $P_{4321} = (0, 13, 15, 1)$ lies on line ℓ_4
85 : $P_{4338} = (1, 14, 15, 1)$ lies on line ℓ_1
86 : $P_{4353} = (0, 15, 15, 1)$ lies on line ℓ_0

The single points on the surface are:

Points on surface but on no line

The surface has 211 points not on any line:
The points on the surface but not on lines are:

0 : $P_0 = (1, 0, 0, 0)$
1 : $P_{59} = (8, 2, 1, 0)$
2 : $P_{80} = (13, 3, 1, 0)$
3 : $P_{98} = (15, 4, 1, 0)$
4 : $P_{106} = (7, 5, 1, 0)$
5 : $P_{124} = (9, 6, 1, 0)$
6 : $P_{133} = (2, 7, 1, 0)$
7 : $P_{159} = (12, 8, 1, 0)$
8 : $P_{166} = (3, 9, 1, 0)$
9 : $P_{215} = (4, 12, 1, 0)$
10 : $P_{241} = (14, 13, 1, 0)$
11 : $P_{248} = (5, 14, 1, 0)$
12 : $P_{265} = (6, 15, 1, 0)$
13 : $P_{311} = (5, 2, 0, 1)$
14 : $P_{330} = (8, 3, 0, 1)$
15 : $P_{346} = (8, 4, 0, 1)$
16 : $P_{369} = (15, 5, 0, 1)$
17 : $P_{373} = (3, 6, 0, 1)$
18 : $P_{394} = (8, 7, 0, 1)$
19 : $P_{405} = (3, 8, 0, 1)$
20 : $P_{433} = (15, 9, 0, 1)$
21 : $P_{481} = (15, 12, 0, 1)$
22 : $P_{487} = (5, 13, 0, 1)$
23 : $P_{501} = (3, 14, 0, 1)$
24 : $P_{519} = (5, 15, 0, 1)$
25 : $P_{585} = (8, 3, 1, 1)$
26 : $P_{588} = (11, 3, 1, 1)$
27 : $P_{619} = (10, 5, 1, 1)$
28 : $P_{624} = (15, 5, 1, 1)$
29 : $P_{660} = (3, 8, 1, 1)$
30 : $P_{668} = (11, 8, 1, 1)$
31 : $P_{699} = (10, 10, 1, 1)$
32 : $P_{716} = (11, 11, 1, 1)$
33 : $P_{774} = (5, 15, 1, 1)$

$34: P_{779} = (10, 15, 1, 1)$
$35: P_{790} = (5, 0, 2, 1)$
$36: P_{821} = (4, 2, 2, 1)$
$37: P_{840} = (7, 3, 2, 1)$
$38: P_{876} = (11, 5, 2, 1)$
$39: P_{894} = (13, 6, 2, 1)$
$40: P_{931} = (2, 9, 2, 1)$
$41: P_{938} = (9, 9, 2, 1)$
$42: P_{966} = (5, 11, 2, 1)$
$43: P_{971} = (10, 11, 2, 1)$
$44: P_{983} = (6, 12, 2, 1)$
$45: P_{984} = (7, 12, 2, 1)$
$46: P_{996} = (3, 13, 2, 1)$
$47: P_{1032} = (7, 15, 2, 1)$
$48: P_{1049} = (8, 0, 3, 1)$
$49: P_{1065} = (8, 1, 3, 1)$
$50: P_{1068} = (11, 1, 3, 1)$
$51: P_{1080} = (7, 2, 3, 1)$
$52: P_{1094} = (5, 3, 3, 1)$
$53: P_{1117} = (12, 4, 3, 1)$
$54: P_{1141} = (4, 6, 3, 1)$
$55: P_{1151} = (14, 6, 3, 1)$
$56: P_{1162} = (9, 7, 3, 1)$
$57: P_{1181} = (12, 8, 3, 1)$
$58: P_{1182} = (13, 8, 3, 1)$
$59: P_{1245} = (12, 12, 3, 1)$
$60: P_{1275} = (10, 14, 3, 1)$
$61: P_{1305} = (8, 0, 4, 1)$
$62: P_{1357} = (12, 3, 4, 1)$
$63: P_{1370} = (9, 4, 4, 1)$
$64: P_{1389} = (12, 5, 4, 1)$
$65: P_{1405} = (12, 6, 4, 1)$
$66: P_{1406} = (13, 6, 4, 1)$
$67: P_{1414} = (5, 7, 4, 1)$
$68: P_{1435} = (10, 8, 4, 1)$
$69: P_{1465} = (8, 10, 4, 1)$
$70: P_{1468} = (11, 10, 4, 1)$
$71: P_{1512} = (7, 13, 4, 1)$
$72: P_{1525} = (4, 14, 4, 1)$
$73: P_{1535} = (14, 14, 4, 1)$
$74: P_{1568} = (15, 0, 5, 1)$
$75: P_{1579} = (10, 1, 5, 1)$
$76: P_{1584} = (15, 1, 5, 1)$
$77: P_{1596} = (11, 2, 5, 1)$
$78: P_{1629} = (12, 4, 5, 1)$
$79: P_{1641} = (8, 5, 5, 1)$
$80: P_{1655} = (6, 6, 5, 1)$
$81: P_{1703} = (6, 9, 5, 1)$
$82: P_{1759} = (14, 12, 5, 1)$
$83: P_{1763} = (2, 13, 5, 1)$
$84: P_{1770} = (9, 13, 5, 1)$
$85: P_{1799} = (6, 15, 5, 1)$
$86: P_{1800} = (7, 15, 5, 1)$
$87: P_{1812} = (3, 0, 6, 1)$
$88: P_{1854} = (13, 2, 6, 1)$
$89: P_{1861} = (4, 3, 6, 1)$
$90: P_{1871} = (14, 3, 6, 1)$
$91: P_{1885} = (12, 4, 6, 1)$
$92: P_{1886} = (13, 4, 6, 1)$
$93: P_{1895} = (6, 5, 6, 1)$
$94: P_{1918} = (13, 6, 6, 1)$
$95: P_{1931} = (10, 7, 6, 1)$
$96: P_{1939} = (2, 8, 6, 1)$
$97: P_{1988} = (3, 11, 6, 1)$
$98: P_{1996} = (11, 11, 6, 1)$
$99: P_{2048} = (15, 14, 6, 1)$
$100: P_{2073} = (8, 0, 7, 1)$
$101: P_{2122} = (9, 3, 7, 1)$
$102: P_{2134} = (5, 4, 7, 1)$
$103: P_{2171} = (10, 6, 7, 1)$
$104: P_{2189} = (12, 7, 7, 1)$
$105: P_{2197} = (4, 8, 7, 1)$
$106: P_{2207} = (14, 8, 7, 1)$
$107: P_{2221} = (12, 9, 7, 1)$
$108: P_{2249} = (8, 11, 7, 1)$
$109: P_{2252} = (11, 11, 7, 1)$
$110: P_{2301} = (12, 14, 7, 1)$
$111: P_{2302} = (13, 14, 7, 1)$
$112: P_{2312} = (7, 15, 7, 1)$
$113: P_{2324} = (3, 0, 8, 1)$
$114: P_{2340} = (3, 1, 8, 1)$
$115: P_{2348} = (11, 1, 8, 1)$
$116: P_{2381} = (12, 3, 8, 1)$
$117: P_{2382} = (13, 3, 8, 1)$
$118: P_{2395} = (10, 4, 8, 1)$
$119: P_{2419} = (2, 6, 8, 1)$
$120: P_{2437} = (4, 7, 8, 1)$
$121: P_{2447} = (14, 7, 8, 1)$
$122: P_{2464} = (15, 8, 8, 1)$
$123: P_{2471} = (6, 9, 8, 1)$
$124: P_{2542} = (13, 13, 8, 1)$
$125: P_{2558} = (13, 14, 8, 1)$
$126: P_{2592} = (15, 0, 9, 1)$
$127: P_{2611} = (2, 2, 9, 1)$
$128: P_{2618} = (9, 2, 9, 1)$
$129: P_{2663} = (6, 5, 9, 1)$
$130: P_{2701} = (12, 7, 9, 1)$
$131: P_{2711} = (6, 8, 9, 1)$
$132: P_{2735} = (14, 9, 9, 1)$
$133: P_{2763} = (10, 11, 9, 1)$
$134: P_{2768} = (15, 11, 9, 1)$
$135: P_{2777} = (8, 12, 9, 1)$
$136: P_{2791} = (6, 13, 9, 1)$
$137: P_{2792} = (7, 13, 9, 1)$
$138: P_{2828} = (11, 15, 9, 1)$
$139: P_{2859} = (10, 1, 10, 1)$
$140: P_{2905} = (8, 4, 10, 1)$
$141: P_{2908} = (11, 4, 10, 1)$

142 : $P_{3004} = (11, 10, 10, 1)$
143 : $P_{3035} = (10, 12, 10, 1)$
144 : $P_{3040} = (15, 12, 10, 1)$
145 : $P_{3046} = (5, 13, 10, 1)$
146 : $P_{3051} = (10, 13, 10, 1)$
147 : $P_{3060} = (3, 14, 10, 1)$
148 : $P_{3068} = (11, 14, 10, 1)$
149 : $P_{3116} = (11, 1, 11, 1)$
150 : $P_{3126} = (5, 2, 11, 1)$
151 : $P_{3131} = (10, 2, 11, 1)$
152 : $P_{3188} = (3, 6, 11, 1)$
153 : $P_{3196} = (11, 6, 11, 1)$
154 : $P_{3209} = (8, 7, 11, 1)$
155 : $P_{3212} = (11, 7, 11, 1)$
156 : $P_{3243} = (10, 9, 11, 1)$
157 : $P_{3248} = (15, 9, 11, 1)$
158 : $P_{3275} = (10, 11, 11, 1)$
159 : $P_{3360} = (15, 0, 12, 1)$
160 : $P_{3383} = (6, 2, 12, 1)$
161 : $P_{3384} = (7, 2, 12, 1)$
162 : $P_{3405} = (12, 3, 12, 1)$
163 : $P_{3439} = (14, 5, 12, 1)$
164 : $P_{3497} = (8, 9, 12, 1)$
165 : $P_{3515} = (10, 10, 12, 1)$
166 : $P_{3520} = (15, 10, 12, 1)$
167 : $P_{3543} = (6, 12, 12, 1)$
168 : $P_{3564} = (11, 13, 12, 1)$
169 : $P_{3575} = (6, 14, 12, 1)$
170 : $P_{3587} = (2, 15, 12, 1)$
171 : $P_{3594} = (9, 15, 12, 1)$
172 : $P_{3606} = (5, 0, 13, 1)$
173 : $P_{3636} = (3, 2, 13, 1)$
174 : $P_{3672} = (7, 4, 13, 1)$
175 : $P_{3683} = (2, 5, 13, 1)$
176 : $P_{3690} = (9, 5, 13, 1)$
177 : $P_{3742} = (13, 8, 13, 1)$
178 : $P_{3751} = (6, 9, 13, 1)$
179 : $P_{3752} = (7, 9, 13, 1)$
180 : $P_{3766} = (5, 10, 13, 1)$
181 : $P_{3771} = (10, 10, 13, 1)$
182 : $P_{3804} = (11, 12, 13, 1)$
183 : $P_{3816} = (7, 13, 13, 1)$
184 : $P_{3845} = (4, 15, 13, 1)$
185 : $P_{3860} = (3, 0, 14, 1)$
186 : $P_{3915} = (10, 3, 14, 1)$
187 : $P_{3925} = (4, 4, 14, 1)$
188 : $P_{3935} = (14, 4, 14, 1)$
189 : $P_{3968} = (15, 6, 14, 1)$
190 : $P_{3981} = (12, 7, 14, 1)$
191 : $P_{3982} = (13, 7, 14, 1)$
192 : $P_{3998} = (13, 8, 14, 1)$
193 : $P_{4020} = (3, 10, 14, 1)$
194 : $P_{4028} = (11, 10, 14, 1)$
195 : $P_{4055} = (6, 12, 14, 1)$
196 : $P_{4083} = (2, 14, 14, 1)$
197 : $P_{4110} = (13, 15, 14, 1)$
198 : $P_{4118} = (5, 0, 15, 1)$
199 : $P_{4134} = (5, 1, 15, 1)$
200 : $P_{4139} = (10, 1, 15, 1)$
201 : $P_{4152} = (7, 2, 15, 1)$
202 : $P_{4199} = (6, 5, 15, 1)$
203 : $P_{4200} = (7, 5, 15, 1)$
204 : $P_{4232} = (7, 7, 15, 1)$
205 : $P_{4268} = (11, 9, 15, 1)$
206 : $P_{4307} = (2, 12, 15, 1)$
207 : $P_{4314} = (9, 12, 15, 1)$
208 : $P_{4325} = (4, 13, 15, 1)$
209 : $P_{4350} = (13, 14, 15, 1)$
210 : $P_{4356} = (3, 15, 15, 1)$

Line Intersection Graph

	0 1 2 3 4 5
0	0 1 1 0 1 0
1	1 0 0 1 0 1
2	1 0 0 1 1 0
3	0 1 1 0 0 1
4	1 0 1 0 0 1
5	0 1 0 1 1 0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_4
in point	P_{35}	P_3	P_3

Line 1 intersects

Line	ℓ_0	ℓ_3	ℓ_5
in point	P_{35}	P_{3250}	P_{3010}

Line 2 intersects

Line	ℓ_0	ℓ_3	ℓ_4
in point	P_3	P_{179}	P_3

Line 3 intersects

Line	ℓ_1	ℓ_2	ℓ_5
in point	P_{3250}	P_{179}	P_4

Line 4 intersects

Line	ℓ_0	ℓ_2	ℓ_5
in point	P_3	P_3	P_{195}

Line 5 intersects

Line	ℓ_1	ℓ_3	ℓ_4
in point	P_{3010}	P_4	P_{195}

The surface has 305 points:
The points on the surface are:

0 : $P_0 = (1, 0, 0, 0)$
1 : $P_3 = (0, 0, 0, 1)$
2 : $P_4 = (1, 1, 1, 1)$
3 : $P_{35} = (0, 1, 1, 0)$
4 : $P_{59} = (8, 2, 1, 0)$
5 : $P_{80} = (13, 3, 1, 0)$
6 : $P_{98} = (15, 4, 1, 0)$
7 : $P_{106} = (7, 5, 1, 0)$
8 : $P_{124} = (9, 6, 1, 0)$
9 : $P_{133} = (2, 7, 1, 0)$
10 : $P_{159} = (12, 8, 1, 0)$
11 : $P_{166} = (3, 9, 1, 0)$
12 : $P_{179} = (0, 10, 1, 0)$
13 : $P_{195} = (0, 11, 1, 0)$
14 : $P_{215} = (4, 12, 1, 0)$
15 : $P_{241} = (14, 13, 1, 0)$
16 : $P_{248} = (5, 14, 1, 0)$
17 : $P_{265} = (6, 15, 1, 0)$
18 : $P_{291} = (1, 1, 0, 1)$
19 : $P_{311} = (5, 2, 0, 1)$
20 : $P_{330} = (8, 3, 0, 1)$
21 : $P_{346} = (8, 4, 0, 1)$
22 : $P_{369} = (15, 5, 0, 1)$
23 : $P_{373} = (3, 6, 0, 1)$
24 : $P_{394} = (8, 7, 0, 1)$
25 : $P_{405} = (3, 8, 0, 1)$
26 : $P_{433} = (15, 9, 0, 1)$
27 : $P_{435} = (1, 10, 0, 1)$
28 : $P_{451} = (1, 11, 0, 1)$
29 : $P_{481} = (15, 12, 0, 1)$
30 : $P_{487} = (5, 13, 0, 1)$
31 : $P_{501} = (3, 14, 0, 1)$
32 : $P_{519} = (5, 15, 0, 1)$
33 : $P_{531} = (1, 0, 1, 1)$
34 : $P_{546} = (0, 1, 1, 1)$
35 : $P_{585} = (8, 3, 1, 1)$
36 : $P_{588} = (11, 3, 1, 1)$
37 : $P_{619} = (10, 5, 1, 1)$
38 : $P_{624} = (15, 5, 1, 1)$
39 : $P_{660} = (3, 8, 1, 1)$
40 : $P_{668} = (11, 8, 1, 1)$
41 : $P_{689} = (0, 10, 1, 1)$
42 : $P_{699} = (10, 10, 1, 1)$
43 : $P_{705} = (0, 11, 1, 1)$
44 : $P_{716} = (11, 11, 1, 1)$
45 : $P_{774} = (5, 15, 1, 1)$
46 : $P_{779} = (10, 15, 1, 1)$
47 : $P_{790} = (5, 0, 2, 1)$
48 : $P_{817} = (0, 2, 2, 1)$
49 : $P_{821} = (4, 2, 2, 1)$
50 : $P_{834} = (1, 3, 2, 1)$
51 : $P_{840} = (7, 3, 2, 1)$
52 : $P_{866} = (1, 5, 2, 1)$
53 : $P_{876} = (11, 5, 2, 1)$
54 : $P_{882} = (1, 6, 2, 1)$
55 : $P_{894} = (13, 6, 2, 1)$
56 : $P_{931} = (2, 9, 2, 1)$
57 : $P_{938} = (9, 9, 2, 1)$
58 : $P_{966} = (5, 11, 2, 1)$
59 : $P_{971} = (10, 11, 2, 1)$
60 : $P_{983} = (6, 12, 2, 1)$
61 : $P_{984} = (7, 12, 2, 1)$
62 : $P_{993} = (0, 13, 2, 1)$
63 : $P_{996} = (3, 13, 2, 1)$
64 : $P_{1025} = (0, 15, 2, 1)$
65 : $P_{1032} = (7, 15, 2, 1)$
66 : $P_{1049} = (8, 0, 3, 1)$
67 : $P_{1065} = (8, 1, 3, 1)$
68 : $P_{1068} = (11, 1, 3, 1)$
69 : $P_{1074} = (1, 2, 3, 1)$
70 : $P_{1080} = (7, 2, 3, 1)$
71 : $P_{1089} = (0, 3, 3, 1)$
72 : $P_{1094} = (5, 3, 3, 1)$
73 : $P_{1105} = (0, 4, 3, 1)$
74 : $P_{1117} = (12, 4, 3, 1)$
75 : $P_{1141} = (4, 6, 3, 1)$
76 : $P_{1151} = (14, 6, 3, 1)$
77 : $P_{1153} = (0, 7, 3, 1)$
78 : $P_{1162} = (9, 7, 3, 1)$
79 : $P_{1181} = (12, 8, 3, 1)$
80 : $P_{1182} = (13, 8, 3, 1)$
81 : $P_{1234} = (1, 12, 3, 1)$
82 : $P_{1245} = (12, 12, 3, 1)$
83 : $P_{1266} = (1, 14, 3, 1)$
84 : $P_{1275} = (10, 14, 3, 1)$
85 : $P_{1305} = (8, 0, 4, 1)$
86 : $P_{1345} = (0, 3, 4, 1)$
87 : $P_{1357} = (12, 3, 4, 1)$
88 : $P_{1361} = (0, 4, 4, 1)$
89 : $P_{1370} = (9, 4, 4, 1)$
90 : $P_{1378} = (1, 5, 4, 1)$
91 : $P_{1389} = (12, 5, 4, 1)$
92 : $P_{1405} = (12, 6, 4, 1)$
93 : $P_{1406} = (13, 6, 4, 1)$
94 : $P_{1409} = (0, 7, 4, 1)$
95 : $P_{1414} = (5, 7, 4, 1)$
96 : $P_{1426} = (1, 8, 4, 1)$
97 : $P_{1435} = (10, 8, 4, 1)$
98 : $P_{1465} = (8, 10, 4, 1)$
99 : $P_{1468} = (11, 10, 4, 1)$
100 : $P_{1506} = (1, 13, 4, 1)$
101 : $P_{1512} = (7, 13, 4, 1)$
102 : $P_{1525} = (4, 14, 4, 1)$
103 : $P_{1535} = (14, 14, 4, 1)$
104 : $P_{1568} = (15, 0, 5, 1)$
105 : $P_{1579} = (10, 1, 5, 1)$
106 : $P_{1584} = (15, 1, 5, 1)$
107 : $P_{1586} = (1, 2, 5, 1)$
108 : $P_{1596} = (11, 2, 5, 1)$
109 : $P_{1618} = (1, 4, 5, 1)$
110 : $P_{1629} = (12, 4, 5, 1)$

111 : $P_{1633} = (0, 5, 5, 1)$
112 : $P_{1641} = (8, 5, 5, 1)$
113 : $P_{1650} = (1, 6, 5, 1)$
114 : $P_{1655} = (6, 6, 5, 1)$
115 : $P_{1697} = (0, 9, 5, 1)$
116 : $P_{1703} = (6, 9, 5, 1)$
117 : $P_{1745} = (0, 12, 5, 1)$
118 : $P_{1759} = (14, 12, 5, 1)$
119 : $P_{1763} = (2, 13, 5, 1)$
120 : $P_{1770} = (9, 13, 5, 1)$
121 : $P_{1799} = (6, 15, 5, 1)$
122 : $P_{1800} = (7, 15, 5, 1)$
123 : $P_{1812} = (3, 0, 6, 1)$
124 : $P_{1842} = (1, 2, 6, 1)$
125 : $P_{1854} = (13, 2, 6, 1)$
126 : $P_{1861} = (4, 3, 6, 1)$
127 : $P_{1871} = (14, 3, 6, 1)$
128 : $P_{1885} = (12, 4, 6, 1)$
129 : $P_{1886} = (13, 4, 6, 1)$
130 : $P_{1890} = (1, 5, 6, 1)$
131 : $P_{1895} = (6, 5, 6, 1)$
132 : $P_{1905} = (0, 6, 6, 1)$
133 : $P_{1918} = (13, 6, 6, 1)$
134 : $P_{1922} = (1, 7, 6, 1)$
135 : $P_{1931} = (10, 7, 6, 1)$
136 : $P_{1937} = (0, 8, 6, 1)$
137 : $P_{1939} = (2, 8, 6, 1)$
138 : $P_{1988} = (3, 11, 6, 1)$
139 : $P_{1996} = (11, 11, 6, 1)$
140 : $P_{2033} = (0, 14, 6, 1)$
141 : $P_{2048} = (15, 14, 6, 1)$
142 : $P_{2073} = (8, 0, 7, 1)$
143 : $P_{2113} = (0, 3, 7, 1)$
144 : $P_{2122} = (9, 3, 7, 1)$
145 : $P_{2129} = (0, 4, 7, 1)$
146 : $P_{2134} = (5, 4, 7, 1)$
147 : $P_{2162} = (1, 6, 7, 1)$
148 : $P_{2171} = (10, 6, 7, 1)$
149 : $P_{2177} = (0, 7, 7, 1)$
150 : $P_{2189} = (12, 7, 7, 1)$
151 : $P_{2197} = (4, 8, 7, 1)$
152 : $P_{2207} = (14, 8, 7, 1)$
153 : $P_{2210} = (1, 9, 7, 1)$
154 : $P_{2221} = (12, 9, 7, 1)$
155 : $P_{2249} = (8, 11, 7, 1)$
156 : $P_{2252} = (11, 11, 7, 1)$
157 : $P_{2301} = (12, 14, 7, 1)$
158 : $P_{2302} = (13, 14, 7, 1)$
159 : $P_{2306} = (1, 15, 7, 1)$
160 : $P_{2312} = (7, 15, 7, 1)$
161 : $P_{2324} = (3, 0, 8, 1)$
162 : $P_{2340} = (3, 1, 8, 1)$
163 : $P_{2348} = (11, 1, 8, 1)$
164 : $P_{2381} = (12, 3, 8, 1)$
165 : $P_{2382} = (13, 3, 8, 1)$
166 : $P_{2386} = (1, 4, 8, 1)$
167 : $P_{2395} = (10, 4, 8, 1)$
168 : $P_{2417} = (0, 6, 8, 1)$
169 : $P_{2419} = (2, 6, 8, 1)$
170 : $P_{2437} = (4, 7, 8, 1)$
171 : $P_{2447} = (14, 7, 8, 1)$
172 : $P_{2449} = (0, 8, 8, 1)$
173 : $P_{2464} = (15, 8, 8, 1)$
174 : $P_{2466} = (1, 9, 8, 1)$
175 : $P_{2471} = (6, 9, 8, 1)$
176 : $P_{2530} = (1, 13, 8, 1)$
177 : $P_{2542} = (13, 13, 8, 1)$
178 : $P_{2545} = (0, 14, 8, 1)$
179 : $P_{2558} = (13, 14, 8, 1)$
180 : $P_{2592} = (15, 0, 9, 1)$
181 : $P_{2611} = (2, 2, 9, 1)$
182 : $P_{2618} = (9, 2, 9, 1)$
183 : $P_{2657} = (0, 5, 9, 1)$
184 : $P_{2663} = (6, 5, 9, 1)$
185 : $P_{2690} = (1, 7, 9, 1)$
186 : $P_{2701} = (12, 7, 9, 1)$
187 : $P_{2706} = (1, 8, 9, 1)$
188 : $P_{2711} = (6, 8, 9, 1)$
189 : $P_{2721} = (0, 9, 9, 1)$
190 : $P_{2735} = (14, 9, 9, 1)$
191 : $P_{2763} = (10, 11, 9, 1)$
192 : $P_{2768} = (15, 11, 9, 1)$
193 : $P_{2769} = (0, 12, 9, 1)$
194 : $P_{2777} = (8, 12, 9, 1)$
195 : $P_{2791} = (6, 13, 9, 1)$
196 : $P_{2792} = (7, 13, 9, 1)$
197 : $P_{2818} = (1, 15, 9, 1)$
198 : $P_{2828} = (11, 15, 9, 1)$
199 : $P_{2834} = (1, 0, 10, 1)$
200 : $P_{2849} = (0, 1, 10, 1)$
201 : $P_{2859} = (10, 1, 10, 1)$
202 : $P_{2905} = (8, 4, 10, 1)$
203 : $P_{2908} = (11, 4, 10, 1)$
204 : $P_{2993} = (0, 10, 10, 1)$
205 : $P_{3004} = (11, 10, 10, 1)$
206 : $P_{3009} = (0, 11, 10, 1)$
207 : $P_{3010} = (1, 11, 10, 1)$
208 : $P_{3035} = (10, 12, 10, 1)$
209 : $P_{3040} = (15, 12, 10, 1)$
210 : $P_{3046} = (5, 13, 10, 1)$
211 : $P_{3051} = (10, 13, 10, 1)$
212 : $P_{3060} = (3, 14, 10, 1)$
213 : $P_{3068} = (11, 14, 10, 1)$
214 : $P_{3090} = (1, 0, 11, 1)$
215 : $P_{3105} = (0, 1, 11, 1)$
216 : $P_{3116} = (11, 1, 11, 1)$
217 : $P_{3126} = (5, 2, 11, 1)$
218 : $P_{3131} = (10, 2, 11, 1)$
219 : $P_{3188} = (3, 6, 11, 1)$
220 : $P_{3196} = (11, 6, 11, 1)$
221 : $P_{3209} = (8, 7, 11, 1)$
222 : $P_{3212} = (11, 7, 11, 1)$
223 : $P_{3243} = (10, 9, 11, 1)$
224 : $P_{3248} = (15, 9, 11, 1)$
225 : $P_{3249} = (0, 10, 11, 1)$
226 : $P_{3250} = (1, 10, 11, 1)$
227 : $P_{3265} = (0, 11, 11, 1)$
228 : $P_{3275} = (10, 11, 11, 1)$
229 : $P_{3360} = (15, 0, 12, 1)$
230 : $P_{3383} = (6, 2, 12, 1)$
231 : $P_{3384} = (7, 2, 12, 1)$
232 : $P_{3394} = (1, 3, 12, 1)$
233 : $P_{3405} = (12, 3, 12, 1)$
234 : $P_{3425} = (0, 5, 12, 1)$
235 : $P_{3439} = (14, 5, 12, 1)$
236 : $P_{3489} = (0, 9, 12, 1)$
237 : $P_{3497} = (8, 9, 12, 1)$
238 : $P_{3515} = (10, 10, 12, 1)$
239 : $P_{3520} = (15, 10, 12, 1)$
240 : $P_{3537} = (0, 12, 12, 1)$
241 : $P_{3543} = (6, 12, 12, 1)$
242 : $P_{3554} = (1, 13, 12, 1)$
243 : $P_{3564} = (11, 13, 12, 1)$
244 : $P_{3570} = (1, 14, 12, 1)$
245 : $P_{3575} = (6, 14, 12, 1)$
246 : $P_{3587} = (2, 15, 12, 1)$
247 : $P_{3594} = (9, 15, 12, 1)$
248 : $P_{3606} = (5, 0, 13, 1)$
249 : $P_{3633} = (0, 2, 13, 1)$
250 : $P_{3636} = (3, 2, 13, 1)$
251 : $P_{3666} = (1, 4, 13, 1)$
252 : $P_{3672} = (7, 4, 13, 1)$
253 : $P_{3683} = (2, 5, 13, 1)$
254 : $P_{3690} = (9, 5, 13, 1)$
255 : $P_{3730} = (1, 8, 13, 1)$
256 : $P_{3742} = (13, 8, 13, 1)$
257 : $P_{3751} = (6, 9, 13, 1)$
258 : $P_{3752} = (7, 9, 13, 1)$
259 : $P_{3766} = (5, 10, 13, 1)$
260 : $P_{3771} = (10, 10, 13, 1)$
261 : $P_{3794} = (1, 12, 13, 1)$
262 : $P_{3804} = (11, 12, 13, 1)$
263 : $P_{3809} = (0, 13, 13, 1)$
264 : $P_{3816} = (7, 13, 13, 1)$
265 : $P_{3841} = (0, 15, 13, 1)$
266 : $P_{3845} = (4, 15, 13, 1)$
267 : $P_{3860} = (3, 0, 14, 1)$
268 : $P_{3906} = (1, 3, 14, 1)$
269 : $P_{3915} = (10, 3, 14, 1)$
270 : $P_{3925} = (4, 4, 14, 1)$
271 : $P_{3935} = (14, 4, 14, 1)$
272 : $P_{3953} = (0, 6, 14, 1)$

$273: P_{3968} = (15, 6, 14, 1)$
$274: P_{3981} = (12, 7, 14, 1)$
$275: P_{3982} = (13, 7, 14, 1)$
$276: P_{3985} = (0, 8, 14, 1)$
$277: P_{3998} = (13, 8, 14, 1)$
$278: P_{4020} = (3, 10, 14, 1)$
$279: P_{4028} = (11, 10, 14, 1)$
$280: P_{4050} = (1, 12, 14, 1)$
$281: P_{4055} = (6, 12, 14, 1)$
$282: P_{4081} = (0, 14, 14, 1)$
$283: P_{4083} = (2, 14, 14, 1)$
$284: P_{4098} = (1, 15, 14, 1)$
$285: P_{4110} = (13, 15, 14, 1)$
$286: P_{4118} = (5, 0, 15, 1)$
$287: P_{4134} = (5, 1, 15, 1)$
$288: P_{4139} = (10, 1, 15, 1)$
$289: P_{4145} = (0, 2, 15, 1)$
$290: P_{4152} = (7, 2, 15, 1)$
$291: P_{4199} = (6, 5, 15, 1)$
$292: P_{4200} = (7, 5, 15, 1)$
$293: P_{4226} = (1, 7, 15, 1)$
$294: P_{4232} = (7, 7, 15, 1)$
$295: P_{4258} = (1, 9, 15, 1)$
$296: P_{4268} = (11, 9, 15, 1)$
$297: P_{4307} = (2, 12, 15, 1)$
$298: P_{4314} = (9, 12, 15, 1)$
$299: P_{4321} = (0, 13, 15, 1)$
$300: P_{4325} = (4, 13, 15, 1)$
$301: P_{4338} = (1, 14, 15, 1)$
$302: P_{4350} = (13, 14, 15, 1)$
$303: P_{4353} = (0, 15, 15, 1)$
$304: P_{4356} = (3, 15, 15, 1)$