Rank-73797 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(32) is -2112846779

General information

Number of lines	3
Number of points	1089
Number of singular points	1
Number of Eckardt points	1
Number of double points	0
Number of single points	96
Number of points off lines	992
Number of Hesse planes	0
Number of axes	0
Type of points on lines	33^3
Type of lines on points	$3, 1^{96}, 0^{992}$

Singular Points

The surface has 1 singular points:

$0 : \ P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$

The 3 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{1024} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{1024} = \mathbf{Pl}(0,0,1,0,0,0)_2$$

$$\ell_1 = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1083424} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1083424} = \mathbf{Pl}(0,1,0,0,0,0)_1$$

$$\ell_2 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{34848} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{34848} = \mathbf{Pl}(0,1,1,0,0,0)_{34}$$

Rank of lines: (1024, 1083424, 34848)
Rank of points on Klein quadric: (2, 1, 34)

Eckardt Points

The surface has 1 Eckardt points:
$0 : P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$.

Double Points

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

Single Points

The surface has 96 single points:
The single points on the surface are:

$0 : P_0 = (1,0,0,0)$ lies on line ℓ_0
$1 : P_3 = (0,0,0,1)$ lies on line ℓ_1
$2 : P_{36} = (1,0,1,0)$ lies on line ℓ_0
$3 : P_{37} = (2,0,1,0)$ lies on line ℓ_0
$4 : P_{38} = (3,0,1,0)$ lies on line ℓ_0
$5 : P_{39} = (4,0,1,0)$ lies on line ℓ_0
$6 : P_{40} = (5,0,1,0)$ lies on line ℓ_0
$7 : P_{41} = (6,0,1,0)$ lies on line ℓ_0
$8 : P_{42} = (7,0,1,0)$ lies on line ℓ_0
$9 : P_{43} = (8,0,1,0)$ lies on line ℓ_0
$10 : P_{44} = (9,0,1,0)$ lies on line ℓ_0
$11 : P_{45} = (10,0,1,0)$ lies on line ℓ_0
$12 : P_{46} = (11,0,1,0)$ lies on line ℓ_0
$13 : P_{47} = (12,0,1,0)$ lies on line ℓ_0
$14 : P_{48} = (13,0,1,0)$ lies on line ℓ_0
$15 : P_{49} = (14,0,1,0)$ lies on line ℓ_0
$16 : P_{50} = (15,0,1,0)$ lies on line ℓ_0
$17 : P_{51} = (16,0,1,0)$ lies on line ℓ_0
$18 : P_{52} = (17,0,1,0)$ lies on line ℓ_0
$19 : P_{53} = (18,0,1,0)$ lies on line ℓ_0
$20 : P_{54} = (19,0,1,0)$ lies on line ℓ_0
$21 : P_{55} = (20,0,1,0)$ lies on line ℓ_0
$22 : P_{56} = (21,0,1,0)$ lies on line ℓ_0
$23 : P_{57} = (22,0,1,0)$ lies on line ℓ_0
$24 : P_{58} = (23,0,1,0)$ lies on line ℓ_0
$25 : P_{59} = (24,0,1,0)$ lies on line ℓ_0
$26 : P_{60} = (25,0,1,0)$ lies on line ℓ_0
$27 : P_{61} = (26,0,1,0)$ lies on line ℓ_0
$28 : P_{62} = (27,0,1,0)$ lies on line ℓ_0
$29 : P_{63} = (28,0,1,0)$ lies on line ℓ_0
$30 : P_{64} = (29,0,1,0)$ lies on line ℓ_0
$31 : P_{65} = (30,0,1,0)$ lies on line ℓ_0
$32 : P_{66} = (31,0,1,0)$ lies on line ℓ_0
$33 : P_{1059} = (1,0,0,1)$ lies on line ℓ_2
$34 : P_{2082} = (0,0,1,1)$ lies on line ℓ_1
$35 : P_{2083} = (1,0,1,1)$ lies on line ℓ_2
$36 : P_{3105} = (0,0,2,1)$ lies on line ℓ_1
$37 : P_{3106} = (1,0,2,1)$ lies on line ℓ_2
$38 : P_{4129} = (0,0,3,1)$ lies on line ℓ_1
$39 : P_{4130} = (1,0,3,1)$ lies on line ℓ_2
$40 : P_{5153} = (0,0,4,1)$ lies on line ℓ_1
$41 : P_{5154} = (1,0,4,1)$ lies on line ℓ_2
$42 : P_{6177} = (0,0,5,1)$ lies on line ℓ_1
$43 : P_{6178} = (1,0,5,1)$ lies on line ℓ_2
$44 : P_{7201} = (0,0,6,1)$ lies on line ℓ_1
$45 : P_{7202} = (1,0,6,1)$ lies on line ℓ_2
$46 : P_{8225} = (0,0,7,1)$ lies on line ℓ_1
$47 : P_{8226} = (1,0,7,1)$ lies on line ℓ_2
$48 : P_{9249} = (0,0,8,1)$ lies on line ℓ_1
$49 : P_{9250} = (1,0,8,1)$ lies on line ℓ_2
$50 : P_{10273} = (0,0,9,1)$ lies on line ℓ_1
$51 : P_{10274} = (1,0,9,1)$ lies on line ℓ_2
$52 : P_{11297} = (0,0,10,1)$ lies on line ℓ_1
$53 : P_{11298} = (1,0,10,1)$ lies on line ℓ_2

54 : $P_{12321} = (0, 0, 11, 1)$ lies on line ℓ_1
55 : $P_{12322} = (1, 0, 11, 1)$ lies on line ℓ_2
56 : $P_{13345} = (0, 0, 12, 1)$ lies on line ℓ_1
57 : $P_{13346} = (1, 0, 12, 1)$ lies on line ℓ_2
58 : $P_{14369} = (0, 0, 13, 1)$ lies on line ℓ_1
59 : $P_{14370} = (1, 0, 13, 1)$ lies on line ℓ_2
60 : $P_{15393} = (0, 0, 14, 1)$ lies on line ℓ_1
61 : $P_{15394} = (1, 0, 14, 1)$ lies on line ℓ_2
62 : $P_{16417} = (0, 0, 15, 1)$ lies on line ℓ_1
63 : $P_{16418} = (1, 0, 15, 1)$ lies on line ℓ_2
64 : $P_{17441} = (0, 0, 16, 1)$ lies on line ℓ_1
65 : $P_{17442} = (1, 0, 16, 1)$ lies on line ℓ_2
66 : $P_{18465} = (0, 0, 17, 1)$ lies on line ℓ_1
67 : $P_{18466} = (1, 0, 17, 1)$ lies on line ℓ_2
68 : $P_{19489} = (0, 0, 18, 1)$ lies on line ℓ_1
69 : $P_{19490} = (1, 0, 18, 1)$ lies on line ℓ_2
70 : $P_{20513} = (0, 0, 19, 1)$ lies on line ℓ_1
71 : $P_{20514} = (1, 0, 19, 1)$ lies on line ℓ_2
72 : $P_{21537} = (0, 0, 20, 1)$ lies on line ℓ_1
73 : $P_{21538} = (1, 0, 20, 1)$ lies on line ℓ_2
74 : $P_{22561} = (0, 0, 21, 1)$ lies on line ℓ_1
75 : $P_{22562} = (1, 0, 21, 1)$ lies on line ℓ_2
76 : $P_{23585} = (0, 0, 22, 1)$ lies on line ℓ_1
77 : $P_{23586} = (1, 0, 22, 1)$ lies on line ℓ_2
78 : $P_{24609} = (0, 0, 23, 1)$ lies on line ℓ_1
79 : $P_{24610} = (1, 0, 23, 1)$ lies on line ℓ_2
80 : $P_{25633} = (0, 0, 24, 1)$ lies on line ℓ_1
81 : $P_{25634} = (1, 0, 24, 1)$ lies on line ℓ_2
82 : $P_{26657} = (0, 0, 25, 1)$ lies on line ℓ_1
83 : $P_{26658} = (1, 0, 25, 1)$ lies on line ℓ_2
84 : $P_{27681} = (0, 0, 26, 1)$ lies on line ℓ_1
85 : $P_{27682} = (1, 0, 26, 1)$ lies on line ℓ_2
86 : $P_{28705} = (0, 0, 27, 1)$ lies on line ℓ_1
87 : $P_{28706} = (1, 0, 27, 1)$ lies on line ℓ_2
88 : $P_{29729} = (0, 0, 28, 1)$ lies on line ℓ_1
89 : $P_{29730} = (1, 0, 28, 1)$ lies on line ℓ_2
90 : $P_{30753} = (0, 0, 29, 1)$ lies on line ℓ_1
91 : $P_{30754} = (1, 0, 29, 1)$ lies on line ℓ_2
92 : $P_{31777} = (0, 0, 30, 1)$ lies on line ℓ_1
93 : $P_{31778} = (1, 0, 30, 1)$ lies on line ℓ_2
94 : $P_{32801} = (0, 0, 31, 1)$ lies on line ℓ_1
95 : $P_{32802} = (1, 0, 31, 1)$ lies on line ℓ_2

The single points on the surface are:

Points on surface but on no line

The surface has 992 points not on any line:
The points on the surface but not on lines are:

0 : $P_4 = (1, 1, 1, 1)$
1 : $P_{68} = (1, 1, 1, 0)$
2 : $P_{103} = (4, 2, 1, 0)$
3 : $P_{136} = (5, 3, 1, 0)$
4 : $P_{179} = (16, 4, 1, 0)$
5 : $P_{212} = (17, 5, 1, 0)$
6 : $P_{247} = (20, 6, 1, 0)$
7 : $P_{280} = (21, 7, 1, 0)$
8 : $P_{301} = (10, 8, 1, 0)$
9 : $P_{334} = (11, 9, 1, 0)$
10 : $P_{369} = (14, 10, 1, 0)$
11 : $P_{402} = (15, 11, 1, 0)$
12 : $P_{445} = (26, 12, 1, 0)$
13 : $P_{478} = (27, 13, 1, 0)$
14 : $P_{513} = (30, 14, 1, 0)$
15 : $P_{546} = (31, 15, 1, 0)$
16 : $P_{560} = (13, 16, 1, 0)$
17 : $P_{591} = (12, 17, 1, 0)$
18 : $P_{620} = (9, 18, 1, 0)$
19 : $P_{651} = (8, 19, 1, 0)$
20 : $P_{704} = (29, 20, 1, 0)$
21 : $P_{735} = (28, 21, 1, 0)$
22 : $P_{764} = (25, 22, 1, 0)$
23 : $P_{795} = (24, 23, 1, 0)$
24 : $P_{810} = (7, 24, 1, 0)$
25 : $P_{841} = (6, 25, 1, 0)$
26 : $P_{870} = (3, 26, 1, 0)$
27 : $P_{901} = (2, 27, 1, 0)$
28 : $P_{954} = (23, 28, 1, 0)$
29 : $P_{985} = (22, 29, 1, 0)$
30 : $P_{1014} = (19, 30, 1, 0)$
31 : $P_{1045} = (18, 31, 1, 0)$
32 : $P_{1176} = (22, 3, 0, 1)$
33 : $P_{1177} = (23, 3, 0, 1)$
34 : $P_{1242} = (24, 5, 0, 1)$
35 : $P_{1243} = (25, 5, 0, 1)$
36 : $P_{1292} = (10, 7, 0, 1)$
37 : $P_{1293} = (11, 7, 0, 1)$
38 : $P_{1372} = (26, 9, 0, 1)$
39 : $P_{1373} = (27, 9, 0, 1)$
40 : $P_{1412} = (2, 11, 0, 1)$
41 : $P_{1413} = (3, 11, 0, 1)$
42 : $P_{1462} = (20, 12, 0, 1)$
43 : $P_{1463} = (21, 12, 0, 1)$

$44: P_{1542} = (4, 15, 0, 1)$
$45: P_{1543} = (5, 15, 0, 1)$
$46: P_{1608} = (6, 17, 0, 1)$
$47: P_{1609} = (7, 17, 0, 1)$
$48: P_{1646} = (12, 18, 0, 1)$
$49: P_{1647} = (13, 18, 0, 1)$
$50: P_{1744} = (14, 21, 0, 1)$
$51: P_{1745} = (15, 21, 0, 1)$
$52: P_{1812} = (18, 23, 0, 1)$
$53: P_{1813} = (19, 23, 0, 1)$
$54: P_{1834} = (8, 24, 0, 1)$
$55: P_{1835} = (9, 24, 0, 1)$
$56: P_{1918} = (28, 26, 0, 1)$
$57: P_{1919} = (29, 26, 0, 1)$
$58: P_{1984} = (30, 28, 0, 1)$
$59: P_{1985} = (31, 28, 0, 1)$
$60: P_{2066} = (16, 31, 0, 1)$
$61: P_{2067} = (17, 31, 0, 1)$
$62: P_{2170} = (25, 2, 1, 1)$
$63: P_{2171} = (26, 2, 1, 1)$
$64: P_{2212} = (3, 4, 1, 1)$
$65: P_{2215} = (6, 4, 1, 1)$
$66: P_{2281} = (8, 6, 1, 1)$
$67: P_{2288} = (15, 6, 1, 1)$
$68: P_{2385} = (16, 9, 1, 1)$
$69: P_{2393} = (24, 9, 1, 1)$
$70: P_{2440} = (7, 11, 1, 1)$
$71: P_{2446} = (13, 11, 1, 1)$
$72: P_{2514} = (17, 13, 1, 1)$
$73: P_{2526} = (29, 13, 1, 1)$
$74: P_{2582} = (21, 15, 1, 1)$
$75: P_{2588} = (27, 15, 1, 1)$
$76: P_{2598} = (5, 16, 1, 1)$
$77: P_{2613} = (20, 16, 1, 1)$
$78: P_{2661} = (4, 18, 1, 1)$
$79: P_{2680} = (23, 18, 1, 1)$
$80: P_{2731} = (10, 20, 1, 1)$
$81: P_{2752} = (31, 20, 1, 1)$
$82: P_{2794} = (9, 22, 1, 1)$
$83: P_{2815} = (30, 22, 1, 1)$
$84: P_{2892} = (11, 25, 1, 1)$
$85: P_{2900} = (19, 25, 1, 1)$
$86: P_{2957} = (12, 27, 1, 1)$
$87: P_{2967} = (22, 27, 1, 1)$
$88: P_{3023} = (14, 29, 1, 1)$
$89: P_{3027} = (18, 29, 1, 1)$
$90: P_{3075} = (2, 31, 1, 1)$
$91: P_{3101} = (28, 31, 1, 1)$
$92: P_{3227} = (26, 3, 2, 1)$
$93: P_{3230} = (29, 3, 2, 1)$
$94: P_{3286} = (21, 5, 2, 1)$
$95: P_{3295} = (30, 5, 2, 1)$
$96: P_{3461} = (4, 11, 2, 1)$
$97: P_{3476} = (19, 11, 2, 1)$
$98: P_{3528} = (7, 13, 2, 1)$
$99: P_{3549} = (28, 13, 2, 1)$
$100: P_{3562} = (9, 14, 2, 1)$
$101: P_{3573} = (20, 14, 2, 1)$
$102: P_{3598} = (13, 15, 2, 1)$
$103: P_{3603} = (18, 15, 2, 1)$
$104: P_{3636} = (19, 16, 2, 1)$
$105: P_{3640} = (23, 16, 2, 1)$
$106: P_{3676} = (27, 17, 2, 1)$
$107: P_{3678} = (29, 17, 2, 1)$
$108: P_{3710} = (29, 18, 2, 1)$
$109: P_{3813} = (4, 22, 2, 1)$
$110: P_{3821} = (12, 22, 2, 1)$
$111: P_{3844} = (3, 23, 2, 1)$
$112: P_{3850} = (9, 23, 2, 1)$
$113: P_{3914} = (9, 25, 2, 1)$
$114: P_{3936} = (31, 25, 2, 1)$
$115: P_{3942} = (5, 26, 2, 1)$
$116: P_{3958} = (21, 26, 2, 1)$
$117: P_{3970} = (1, 27, 2, 1)$
$118: P_{3988} = (19, 27, 2, 1)$
$119: P_{4037} = (4, 29, 2, 1)$
$120: P_{4059} = (26, 29, 2, 1)$
$121: P_{4067} = (2, 30, 2, 1)$
$122: P_{4091} = (26, 30, 2, 1)$
$123: P_{4112} = (15, 31, 2, 1)$
$124: P_{4118} = (21, 31, 2, 1)$
$125: P_{4174} = (13, 1, 3, 1)$
$126: P_{4176} = (15, 1, 3, 1)$
$127: P_{4233} = (8, 3, 3, 1)$
$128: P_{4237} = (12, 3, 3, 1)$
$129: P_{4372} = (19, 7, 3, 1)$
$130: P_{4380} = (27, 7, 3, 1)$
$131: P_{4424} = (7, 9, 3, 1)$
$132: P_{4446} = (29, 9, 3, 1)$
$133: P_{4453} = (4, 10, 3, 1)$
$134: P_{4476} = (27, 10, 3, 1)$
$135: P_{4526} = (13, 12, 3, 1)$
$136: P_{4537} = (24, 12, 3, 1)$
$137: P_{4558} = (13, 13, 3, 1)$
$138: P_{4572} = (27, 13, 3, 1)$
$139: P_{4592} = (15, 14, 3, 1)$
$140: P_{4605} = (28, 14, 3, 1)$
$141: P_{4624} = (15, 15, 3, 1)$
$142: P_{4640} = (31, 15, 3, 1)$
$143: P_{4650} = (9, 16, 3, 1)$
$144: P_{4670} = (29, 16, 3, 1)$
$145: P_{4708} = (3, 18, 3, 1)$
$146: P_{4722} = (17, 18, 3, 1)$
$147: P_{4867} = (2, 23, 3, 1)$
$148: P_{4896} = (31, 23, 3, 1)$
$149: P_{4916} = (19, 24, 3, 1)$
$150: P_{4928} = (31, 24, 3, 1)$
$151: P_{4947} = (18, 25, 3, 1)$

$152: P_{4958} = (29, 25, 3, 1)$
$153: P_{4962} = (1, 26, 3, 1)$
$154: P_{4972} = (11, 26, 3, 1)$
$155: P_{5041} = (16, 28, 3, 1)$
$156: P_{5140} = (19, 31, 3, 1)$
$157: P_{5143} = (22, 31, 3, 1)$
$158: P_{5218} = (1, 2, 4, 1)$
$159: P_{5225} = (8, 2, 4, 1)$
$160: P_{5266} = (17, 3, 4, 1)$
$161: P_{5277} = (28, 3, 4, 1)$
$162: P_{5316} = (3, 5, 4, 1)$
$163: P_{5335} = (22, 5, 4, 1)$
$164: P_{5356} = (11, 6, 4, 1)$
$165: P_{5363} = (18, 6, 4, 1)$
$166: P_{5463} = (22, 9, 4, 1)$
$167: P_{5539} = (2, 12, 4, 1)$
$168: P_{5559} = (22, 12, 4, 1)$
$169: P_{5577} = (8, 13, 4, 1)$
$170: P_{5593} = (24, 13, 4, 1)$
$171: P_{5641} = (8, 15, 4, 1)$
$172: P_{5649} = (16, 15, 4, 1)$
$173: P_{5716} = (19, 17, 4, 1)$
$174: P_{5725} = (28, 17, 4, 1)$
$175: P_{5757} = (28, 18, 4, 1)$
$176: P_{5760} = (31, 18, 4, 1)$
$177: P_{5764} = (3, 19, 4, 1)$
$178: P_{5765} = (4, 19, 4, 1)$
$179: P_{5860} = (3, 22, 4, 1)$
$180: P_{5873} = (16, 22, 4, 1)$
$181: P_{5926} = (5, 24, 4, 1)$
$182: P_{5932} = (11, 24, 4, 1)$
$183: P_{5969} = (16, 25, 4, 1)$
$184: P_{5979} = (26, 25, 4, 1)$
$185: P_{6038} = (21, 27, 4, 1)$
$186: P_{6040} = (23, 27, 4, 1)$
$187: P_{6124} = (11, 30, 4, 1)$
$188: P_{6142} = (29, 30, 4, 1)$
$189: P_{6154} = (9, 31, 4, 1)$
$190: P_{6172} = (27, 31, 4, 1)$
$191: P_{6236} = (27, 1, 5, 1)$
$192: P_{6240} = (31, 1, 5, 1)$
$193: P_{6274} = (1, 3, 5, 1)$
$194: P_{6288} = (15, 3, 5, 1)$
$195: P_{6347} = (10, 5, 5, 1)$
$196: P_{6363} = (26, 5, 5, 1)$
$197: P_{6378} = (9, 6, 5, 1)$
$198: P_{6391} = (22, 6, 5, 1)$
$199: P_{6409} = (8, 7, 5, 1)$
$200: P_{6419} = (18, 7, 5, 1)$
$201: P_{6470} = (5, 9, 5, 1)$
$202: P_{6477} = (12, 9, 5, 1)$
$203: P_{6550} = (21, 11, 5, 1)$
$204: P_{6551} = (22, 11, 5, 1)$
$205: P_{6604} = (11, 13, 5, 1)$
$206: P_{6615} = (22, 13, 5, 1)$
$207: P_{6627} = (2, 14, 5, 1)$
$208: P_{6641} = (16, 14, 5, 1)$
$209: P_{6761} = (8, 18, 5, 1)$
$210: P_{6778} = (25, 18, 5, 1)$
$211: P_{6851} = (2, 21, 5, 1)$
$212: P_{6857} = (8, 21, 5, 1)$
$213: P_{6926} = (13, 23, 5, 1)$
$214: P_{6949} = (4, 24, 5, 1)$
$215: P_{6963} = (18, 24, 5, 1)$
$216: P_{7016} = (7, 26, 5, 1)$
$217: P_{7036} = (27, 26, 5, 1)$
$218: P_{7043} = (2, 27, 5, 1)$
$219: P_{7068} = (27, 27, 5, 1)$
$220: P_{7160} = (23, 30, 5, 1)$
$221: P_{7168} = (31, 30, 5, 1)$
$222: P_{7187} = (18, 31, 5, 1)$
$223: P_{7200} = (31, 31, 5, 1)$
$224: P_{7363} = (2, 5, 6, 1)$
$225: P_{7390} = (29, 5, 6, 1)$
$226: P_{7430} = (5, 7, 6, 1)$
$227: P_{7447} = (22, 7, 6, 1)$
$228: P_{7503} = (14, 9, 6, 1)$
$229: P_{7517} = (28, 9, 6, 1)$
$230: P_{7536} = (15, 10, 6, 1)$
$231: P_{7544} = (23, 10, 6, 1)$
$232: P_{7565} = (12, 11, 6, 1)$
$233: P_{7571} = (18, 11, 6, 1)$
$234: P_{7652} = (3, 14, 6, 1)$
$235: P_{7731} = (18, 16, 6, 1)$
$236: P_{7741} = (28, 16, 6, 1)$
$237: P_{7811} = (2, 19, 6, 1)$
$238: P_{7815} = (6, 19, 6, 1)$
$239: P_{7848} = (7, 20, 6, 1)$
$240: P_{7858} = (17, 20, 6, 1)$
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647 : $P_{20678} = (5, 5, 19, 1)$
648 : $P_{20690} = (17, 5, 19, 1)$
649 : $P_{20814} = (13, 9, 19, 1)$
650 : $P_{20820} = (19, 9, 19, 1)$
651 : $P_{20855} = (22, 10, 19, 1)$
652 : $P_{20857} = (24, 10, 19, 1)$
653 : $P_{20982} = (21, 14, 19, 1)$
654 : $P_{20990} = (29, 14, 19, 1)$
655 : $P_{21228} = (11, 22, 19, 1)$
656 : $P_{21240} = (23, 22, 19, 1)$
657 : $P_{21272} = (23, 23, 19, 1)$
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659 : $P_{21296} = (15, 24, 19, 1)$
660 : $P_{21307} = (26, 24, 19, 1)$
661 : $P_{21353} = (8, 26, 19, 1)$
662 : $P_{21375} = (30, 26, 19, 1)$
663 : $P_{21394} = (17, 27, 19, 1)$
664 : $P_{21397} = (20, 27, 19, 1)$
665 : $P_{21465} = (24, 29, 19, 1)$
666 : $P_{21474} = (1, 30, 19, 1)$
667 : $P_{21490} = (17, 30, 19, 1)$
668 : $P_{21606} = (5, 2, 20, 1)$
669 : $P_{21610} = (9, 2, 20, 1)$
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671 : $P_{21752} = (23, 6, 20, 1)$
672 : $P_{21797} = (4, 8, 20, 1)$
673 : $P_{21813} = (20, 8, 20, 1)$
674 : $P_{21912} = (23, 11, 20, 1)$
675 : $P_{21919} = (30, 11, 20, 1)$
676 : $P_{21962} = (9, 13, 20, 1)$
677 : $P_{21976} = (23, 13, 20, 1)$
678 : $P_{22009} = (24, 14, 20, 1)$
679 : $P_{22016} = (31, 14, 20, 1)$
680 : $P_{22026} = (9, 15, 20, 1)$
681 : $P_{22043} = (26, 15, 20, 1)$
682 : $P_{22085} = (4, 17, 20, 1)$
683 : $P_{22103} = (22, 17, 20, 1)$
684 : $P_{22226} = (17, 21, 20, 1)$
685 : $P_{22234} = (25, 21, 20, 1)$
686 : $P_{22251} = (10, 22, 20, 1)$
687 : $P_{22268} = (27, 22, 20, 1)$
688 : $P_{22341} = (4, 25, 20, 1)$
689 : $P_{22344} = (7, 25, 20, 1)$
690 : $P_{22438} = (5, 28, 20, 1)$
691 : $P_{22441} = (8, 28, 20, 1)$

692 : $P_{22477} = (12, 29, 20, 1)$
693 : $P_{22486} = (21, 29, 20, 1)$
694 : $P_{22502} = (5, 30, 20, 1)$
695 : $P_{22701} = (12, 4, 21, 1)$
696 : $P_{22708} = (19, 4, 21, 1)$
697 : $P_{22786} = (1, 7, 21, 1)$
698 : $P_{22789} = (4, 7, 21, 1)$
699 : $P_{22831} = (14, 8, 21, 1)$
700 : $P_{22839} = (22, 8, 21, 1)$
701 : $P_{22889} = (8, 10, 21, 1)$
702 : $P_{22912} = (31, 10, 21, 1)$
703 : $P_{23113} = (8, 17, 21, 1)$
704 : $P_{23116} = (11, 17, 21, 1)$
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706 : $P_{23231} = (30, 20, 21, 1)$
707 : $P_{23239} = (6, 21, 21, 1)$
708 : $P_{23260} = (27, 21, 21, 1)$
709 : $P_{23402} = (9, 26, 21, 1)$
710 : $P_{23433} = (8, 27, 21, 1)$
711 : $P_{23454} = (29, 27, 21, 1)$
712 : $P_{23464} = (7, 28, 21, 1)$
713 : $P_{23479} = (22, 28, 21, 1)$
714 : $P_{23505} = (16, 29, 21, 1)$
715 : $P_{23509} = (20, 29, 21, 1)$
716 : $P_{23656} = (7, 2, 22, 1)$
717 : $P_{23664} = (15, 2, 22, 1)$
718 : $P_{23781} = (4, 6, 22, 1)$
719 : $P_{23807} = (30, 6, 22, 1)$
720 : $P_{23853} = (12, 8, 22, 1)$
721 : $P_{24046} = (13, 14, 22, 1)$
722 : $P_{24055} = (22, 14, 22, 1)$
723 : $P_{24109} = (12, 16, 22, 1)$
724 : $P_{24112} = (15, 16, 22, 1)$
725 : $P_{24166} = (5, 18, 22, 1)$
726 : $P_{24176} = (15, 18, 22, 1)$
727 : $P_{24202} = (9, 19, 22, 1)$
728 : $P_{24214} = (21, 19, 22, 1)$
729 : $P_{24238} = (13, 20, 22, 1)$
730 : $P_{24253} = (28, 20, 22, 1)$
731 : $P_{24341} = (20, 23, 22, 1)$
732 : $P_{24347} = (26, 23, 22, 1)$
733 : $P_{24365} = (12, 24, 22, 1)$
734 : $P_{24367} = (14, 24, 22, 1)$
735 : $P_{24388} = (3, 25, 22, 1)$
736 : $P_{24408} = (23, 25, 22, 1)$
737 : $P_{24423} = (6, 26, 22, 1)$
738 : $P_{24430} = (13, 26, 22, 1)$
739 : $P_{24514} = (1, 29, 22, 1)$
740 : $P_{24520} = (7, 29, 22, 1)$
741 : $P_{24584} = (7, 31, 22, 1)$
742 : $P_{24585} = (8, 31, 22, 1)$
743 : $P_{24751} = (14, 4, 23, 1)$
744 : $P_{24762} = (25, 4, 23, 1)$
745 : $P_{24784} = (15, 5, 23, 1)$
746 : $P_{25028} = (3, 13, 23, 1)$
747 : $P_{25035} = (10, 13, 23, 1)$
748 : $P_{25063} = (6, 14, 23, 1)$
749 : $P_{25076} = (19, 14, 23, 1)$
750 : $P_{25319} = (6, 22, 23, 1)$
751 : $P_{25321} = (8, 22, 23, 1)$
752 : $P_{25349} = (4, 23, 23, 1)$
753 : $P_{25374} = (29, 23, 23, 1)$
754 : $P_{25383} = (6, 24, 23, 1)$
755 : $P_{25405} = (28, 24, 23, 1)$
756 : $P_{25431} = (22, 25, 23, 1)$
757 : $P_{25436} = (27, 25, 23, 1)$
758 : $P_{25455} = (14, 26, 23, 1)$
759 : $P_{25472} = (31, 26, 23, 1)$
760 : $P_{25506} = (1, 28, 23, 1)$
761 : $P_{25518} = (13, 28, 23, 1)$
762 : $P_{25578} = (9, 30, 23, 1)$
763 : $P_{25583} = (14, 30, 23, 1)$
764 : $P_{25747} = (18, 3, 24, 1)$
765 : $P_{25759} = (30, 3, 24, 1)$
766 : $P_{25827} = (2, 6, 24, 1)$
767 : $P_{25850} = (25, 6, 24, 1)$
768 : $P_{25877} = (20, 7, 24, 1)$
769 : $P_{25880} = (23, 7, 24, 1)$
770 : $P_{26151} = (6, 16, 24, 1)$
771 : $P_{26175} = (30, 16, 24, 1)$
772 : $P_{26208} = (31, 17, 24, 1)$
773 : $P_{26252} = (11, 19, 24, 1)$
774 : $P_{26271} = (30, 19, 24, 1)$
775 : $P_{26370} = (1, 23, 24, 1)$
776 : $P_{26396} = (27, 23, 24, 1)$
777 : $P_{26417} = (16, 24, 24, 1)$
778 : $P_{26423} = (22, 24, 24, 1)$
779 : $P_{26443} = (10, 25, 24, 1)$
780 : $P_{26453} = (20, 25, 24, 1)$
781 : $P_{26502} = (5, 27, 24, 1)$
782 : $P_{26511} = (14, 27, 24, 1)$
783 : $P_{26601} = (8, 30, 24, 1)$
784 : $P_{26613} = (20, 30, 24, 1)$
785 : $P_{26773} = (20, 3, 25, 1)$
786 : $P_{26780} = (27, 3, 25, 1)$
787 : $P_{26806} = (21, 4, 25, 1)$
788 : $P_{26816} = (31, 4, 25, 1)$
789 : $P_{26854} = (5, 6, 25, 1)$
790 : $P_{26873} = (24, 6, 25, 1)$
791 : $P_{26907} = (26, 7, 25, 1)$
792 : $P_{26911} = (30, 7, 25, 1)$
793 : $P_{26924} = (11, 8, 25, 1)$
794 : $P_{26941} = (28, 8, 25, 1)$
795 : $P_{26962} = (17, 9, 25, 1)$
796 : $P_{26976} = (31, 9, 25, 1)$
797 : $P_{27003} = (26, 10, 25, 1)$
798 : $P_{27099} = (26, 13, 25, 1)$
799 : $P_{27104} = (31, 13, 25, 1)$

800 : $P_{27243} = (10, 18, 25, 1)$
801 : $P_{27254} = (21, 18, 25, 1)$
802 : $P_{27313} = (16, 20, 25, 1)$
803 : $P_{27316} = (19, 20, 25, 1)$
804 : $P_{27362} = (1, 22, 25, 1)$
805 : $P_{27382} = (21, 22, 25, 1)$
806 : $P_{27428} = (3, 24, 25, 1)$
807 : $P_{27454} = (29, 24, 25, 1)$
808 : $P_{27608} = (23, 29, 25, 1)$
809 : $P_{27612} = (27, 29, 25, 1)$
810 : $P_{27642} = (25, 30, 25, 1)$
811 : $P_{27644} = (27, 30, 25, 1)$
812 : $P_{27724} = (11, 1, 26, 1)$
813 : $P_{27729} = (16, 1, 26, 1)$
814 : $P_{27827} = (18, 4, 26, 1)$
815 : $P_{27829} = (20, 4, 26, 1)$
816 : $P_{27939} = (2, 8, 26, 1)$
817 : $P_{27950} = (13, 8, 26, 1)$
818 : $P_{28012} = (11, 10, 26, 1)$
819 : $P_{28022} = (21, 10, 26, 1)$
820 : $P_{28044} = (11, 11, 26, 1)$
821 : $P_{28048} = (15, 11, 26, 1)$
822 : $P_{28066} = (1, 12, 26, 1)$
823 : $P_{28074} = (9, 12, 26, 1)$
824 : $P_{28190} = (29, 15, 26, 1)$
825 : $P_{28191} = (30, 15, 26, 1)$
826 : $P_{28206} = (13, 16, 26, 1)$
827 : $P_{28209} = (16, 16, 26, 1)$
828 : $P_{28241} = (16, 17, 26, 1)$
829 : $P_{28248} = (23, 17, 26, 1)$
830 : $P_{28277} = (20, 18, 26, 1)$
831 : $P_{28281} = (24, 18, 26, 1)$
832 : $P_{28357} = (4, 21, 26, 1)$
833 : $P_{28405} = (20, 22, 26, 1)$
834 : $P_{28416} = (31, 22, 26, 1)$
835 : $P_{28432} = (15, 23, 26, 1)$
836 : $P_{28447} = (30, 23, 26, 1)$
837 : $P_{28462} = (13, 24, 26, 1)$
838 : $P_{28479} = (30, 24, 26, 1)$
839 : $P_{28530} = (17, 26, 26, 1)$
840 : $P_{28532} = (19, 26, 26, 1)$
841 : $P_{28592} = (15, 28, 26, 1)$
842 : $P_{28604} = (27, 28, 26, 1)$
843 : $P_{28678} = (5, 31, 26, 1)$
844 : $P_{28699} = (26, 31, 26, 1)$
845 : $P_{28808} = (7, 3, 27, 1)$
846 : $P_{28815} = (14, 3, 27, 1)$
847 : $P_{28861} = (28, 4, 27, 1)$
848 : $P_{28863} = (30, 4, 27, 1)$
849 : $P_{28878} = (13, 5, 27, 1)$
850 : $P_{28885} = (20, 5, 27, 1)$
851 : $P_{28995} = (2, 9, 27, 1)$
852 : $P_{29023} = (30, 9, 27, 1)$
853 : $P_{29031} = (6, 10, 27, 1)$
854 : $P_{29043} = (18, 10, 27, 1)$
855 : $P_{29073} = (16, 11, 27, 1)$
856 : $P_{29088} = (31, 11, 27, 1)$
857 : $P_{29092} = (3, 12, 27, 1)$
858 : $P_{29096} = (7, 12, 27, 1)$
859 : $P_{29122} = (1, 13, 27, 1)$
860 : $P_{29151} = (30, 13, 27, 1)$
861 : $P_{29165} = (12, 14, 27, 1)$
862 : $P_{29180} = (27, 14, 27, 1)$
863 : $P_{29192} = (7, 15, 27, 1)$
864 : $P_{29196} = (11, 15, 27, 1)$
865 : $P_{29238} = (21, 16, 27, 1)$
866 : $P_{29241} = (24, 16, 27, 1)$
867 : $P_{29347} = (2, 20, 27, 1)$
868 : $P_{29357} = (12, 20, 27, 1)$
869 : $P_{29424} = (15, 22, 27, 1)$
870 : $P_{29427} = (18, 22, 27, 1)$
871 : $P_{29549} = (12, 26, 27, 1)$
872 : $P_{29557} = (20, 26, 27, 1)$
873 : $P_{29619} = (18, 28, 27, 1)$
874 : $P_{29627} = (26, 28, 27, 1)$
875 : $P_{29635} = (2, 29, 27, 1)$
876 : $P_{29650} = (17, 29, 27, 1)$
877 : $P_{29717} = (20, 31, 27, 1)$
878 : $P_{29803} = (10, 2, 28, 1)$
879 : $P_{29815} = (22, 2, 28, 1)$
880 : $P_{29836} = (11, 3, 28, 1)$
881 : $P_{30074} = (25, 10, 28, 1)$
882 : $P_{30079} = (30, 10, 28, 1)$
883 : $P_{30123} = (10, 12, 28, 1)$
884 : $P_{30128} = (15, 12, 28, 1)$
885 : $P_{30187} = (10, 14, 28, 1)$
886 : $P_{30195} = (18, 14, 28, 1)$
887 : $P_{30249} = (8, 16, 28, 1)$
888 : $P_{30267} = (26, 16, 28, 1)$
889 : $P_{30402} = (1, 21, 28, 1)$
890 : $P_{30417} = (16, 21, 28, 1)$
891 : $P_{30446} = (13, 22, 28, 1)$
892 : $P_{30462} = (29, 22, 28, 1)$
893 : $P_{30486} = (21, 23, 28, 1)$
894 : $P_{30490} = (25, 23, 28, 1)$
895 : $P_{30627} = (2, 28, 28, 1)$
896 : $P_{30645} = (20, 28, 28, 1)$
897 : $P_{30676} = (19, 29, 28, 1)$
898 : $P_{30682} = (25, 29, 28, 1)$
899 : $P_{30892} = (11, 4, 29, 1)$
900 : $P_{30898} = (17, 4, 29, 1)$
901 : $P_{30961} = (16, 6, 29, 1)$
902 : $P_{30966} = (21, 6, 29, 1)$
903 : $P_{31089} = (16, 10, 29, 1)$
904 : $P_{31102} = (29, 10, 29, 1)$
905 : $P_{31153} = (16, 12, 29, 1)$
906 : $P_{31162} = (25, 12, 29, 1)$
907 : $P_{31252} = (19, 15, 29, 1)$

908 : $P_{31257} = (24, 15, 29, 1)$
909 : $P_{31378} = (17, 19, 29, 1)$
910 : $P_{31394} = (1, 20, 29, 1)$
911 : $P_{31417} = (24, 20, 29, 1)$
912 : $P_{31483} = (26, 22, 29, 1)$
913 : $P_{31485} = (28, 22, 29, 1)$
914 : $P_{31499} = (10, 23, 29, 1)$
915 : $P_{31506} = (17, 23, 29, 1)$
916 : $P_{31555} = (2, 25, 29, 1)$
917 : $P_{31567} = (14, 25, 29, 1)$
918 : $P_{31628} = (11, 27, 29, 1)$
919 : $P_{31641} = (24, 27, 29, 1)$
920 : $P_{31655} = (6, 28, 29, 1)$
921 : $P_{31661} = (12, 28, 29, 1)$
922 : $P_{31720} = (7, 30, 29, 1)$
923 : $P_{31731} = (18, 30, 29, 1)$
924 : $P_{31748} = (3, 31, 29, 1)$
925 : $P_{31756} = (11, 31, 29, 1)$
926 : $P_{31812} = (3, 1, 30, 1)$
927 : $P_{31837} = (28, 1, 30, 1)$
928 : $P_{31844} = (3, 2, 30, 1)$
929 : $P_{31868} = (27, 2, 30, 1)$
930 : $P_{31876} = (3, 3, 30, 1)$
931 : $P_{31878} = (5, 3, 30, 1)$
932 : $P_{32056} = (23, 8, 30, 1)$
933 : $P_{32062} = (29, 8, 30, 1)$
934 : $P_{32104} = (7, 10, 30, 1)$
935 : $P_{32117} = (20, 10, 30, 1)$
936 : $P_{32175} = (14, 12, 30, 1)$
937 : $P_{32180} = (19, 12, 30, 1)$
938 : $P_{32198} = (5, 13, 30, 1)$
939 : $P_{32199} = (6, 13, 30, 1)$
940 : $P_{32226} = (1, 14, 30, 1)$
941 : $P_{32230} = (5, 14, 30, 1)$
942 : $P_{32369} = (16, 18, 30, 1)$
943 : $P_{32383} = (30, 18, 30, 1)$
944 : $P_{32440} = (23, 20, 30, 1)$
945 : $P_{32524} = (11, 23, 30, 1)$
946 : $P_{32525} = (12, 23, 30, 1)$
947 : $P_{32645} = (4, 27, 30, 1)$
948 : $P_{32672} = (31, 27, 30, 1)$
949 : $P_{32696} = (23, 28, 30, 1)$
950 : $P_{32701} = (28, 28, 30, 1)$
951 : $P_{32714} = (9, 29, 30, 1)$
952 : $P_{32733} = (28, 29, 30, 1)$
953 : $P_{32841} = (8, 1, 31, 1)$
954 : $P_{32855} = (22, 1, 31, 1)$
955 : $P_{32878} = (13, 2, 31, 1)$
956 : $P_{32888} = (23, 2, 31, 1)$
957 : $P_{32944} = (15, 4, 31, 1)$
958 : $P_{32958} = (29, 4, 31, 1)$
959 : $P_{32967} = (6, 5, 31, 1)$
960 : $P_{32972} = (11, 5, 31, 1)$
961 : $P_{33012} = (19, 6, 31, 1)$
962 : $P_{33019} = (26, 6, 31, 1)$
963 : $P_{33039} = (14, 7, 31, 1)$
964 : $P_{33049} = (24, 7, 31, 1)$
965 : $P_{33065} = (8, 8, 31, 1)$
966 : $P_{33067} = (10, 8, 31, 1)$
967 : $P_{33097} = (8, 9, 31, 1)$
968 : $P_{33110} = (21, 9, 31, 1)$
969 : $P_{33126} = (5, 10, 31, 1)$
970 : $P_{33149} = (28, 10, 31, 1)$
971 : $P_{33282} = (1, 15, 31, 1)$
972 : $P_{33301} = (20, 15, 31, 1)$
973 : $P_{33358} = (13, 17, 31, 1)$
974 : $P_{33366} = (21, 17, 31, 1)$
975 : $P_{33383} = (6, 18, 31, 1)$
976 : $P_{33403} = (26, 18, 31, 1)$
977 : $P_{33422} = (13, 19, 31, 1)$
978 : $P_{33423} = (14, 19, 31, 1)$
979 : $P_{33455} = (14, 20, 31, 1)$
980 : $P_{33467} = (26, 20, 31, 1)$
981 : $P_{33527} = (22, 22, 31, 1)$
982 : $P_{33530} = (25, 22, 31, 1)$
983 : $P_{33543} = (6, 23, 31, 1)$
984 : $P_{33559} = (22, 23, 31, 1)$
985 : $P_{33586} = (17, 24, 31, 1)$
986 : $P_{33590} = (21, 24, 31, 1)$
987 : $P_{33648} = (15, 26, 31, 1)$
988 : $P_{33649} = (16, 26, 31, 1)$
989 : $P_{33695} = (30, 27, 31, 1)$
990 : $P_{33764} = (3, 30, 31, 1)$
991 : $P_{33776} = (15, 30, 31, 1)$

Line Intersection Graph

	0	1	2
0	0	1	1
1	1	0	1
2	1	1	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2
in point	P_2	P_2

Line 1 intersects

Line	ℓ_0	ℓ_2
in point	P_2	P_2

Line 2 intersects

Line	ℓ_0	ℓ_1
in point	P_2	P_2

The surface has 1089 points:
Too many to print.