Rank-65863 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

$$X_2^3 + X_0^2X_3 + X_1^2X_2 + X_0X_1X_2 = 0$$

(0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(32) is -2112845787

General information

Number of lines	3
Number of points	1089
Number of singular points	1
Number of Eckardt points	0
Number of double points	2
Number of single points	95
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	2^2, 1^{95}, 0^{992}

Singular Points

The surface has 1 singular points:

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

The 3 Lines

The lines and their Pluecker coordinates are:

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

$$\ell_1 = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{1082400} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{1082400} = \mathbf{Pl}(0,0,0,1,0,0)_{65}$$

$$\ell_2 = \left[\begin{array}{cccc} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{1082433} = \left[\begin{array}{cccc} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{1082433} = \mathbf{Pl}(0,1,0,1,0,0)_{97}$$

Rank of lines: (0, 1082400, 1082433)
Rank of points on Klein quadric: (0, 65, 97)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

The surface has 2 Double points:
The double points on the surface are:

$P_1 = (0,1,0,0) = \ell_0 \cap \ell_1$
$P_3 = (0,0,0,1) = \ell_1 \cap \ell_2$

Single Points

The surface has 95 single points:
The single points on the surface are:

0 : $P_0 = (1,0,0,0)$ lies on line ℓ_0
1 : $P_5 = (1,1,0,0)$ lies on line ℓ_0
2 : $P_6 = (2,1,0,0)$ lies on line ℓ_0
3 : $P_7 = (3,1,0,0)$ lies on line ℓ_0
4 : $P_8 = (4,1,0,0)$ lies on line ℓ_0
5 : $P_9 = (5,1,0,0)$ lies on line ℓ_0
6 : $P_{10} = (6,1,0,0)$ lies on line ℓ_0
7 : $P_{11} = (7,1,0,0)$ lies on line ℓ_0
8 : $P_{12} = (8,1,0,0)$ lies on line ℓ_0
9 : $P_{13} = (9,1,0,0)$ lies on line ℓ_0
10 : $P_{14} = (10,1,0,0)$ lies on line ℓ_0
11 : $P_{15} = (11,1,0,0)$ lies on line ℓ_0
12 : $P_{16} = (12,1,0,0)$ lies on line ℓ_0
13 : $P_{17} = (13,1,0,0)$ lies on line ℓ_0
14 : $P_{18} = (14,1,0,0)$ lies on line ℓ_0
15 : $P_{19} = (15,1,0,0)$ lies on line ℓ_0
16 : $P_{20} = (16,1,0,0)$ lies on line ℓ_0
17 : $P_{21} = (17,1,0,0)$ lies on line ℓ_0
18 : $P_{22} = (18,1,0,0)$ lies on line ℓ_0
19 : $P_{23} = (19,1,0,0)$ lies on line ℓ_0
20 : $P_{24} = (20,1,0,0)$ lies on line ℓ_0
21 : $P_{25} = (21,1,0,0)$ lies on line ℓ_0
22 : $P_{26} = (22,1,0,0)$ lies on line ℓ_0
23 : $P_{27} = (23,1,0,0)$ lies on line ℓ_0
24 : $P_{28} = (24,1,0,0)$ lies on line ℓ_0
25 : $P_{29} = (25,1,0,0)$ lies on line ℓ_0
26 : $P_{30} = (26,1,0,0)$ lies on line ℓ_0
27 : $P_{31} = (27,1,0,0)$ lies on line ℓ_0
28 : $P_{32} = (28,1,0,0)$ lies on line ℓ_0
29 : $P_{33} = (29,1,0,0)$ lies on line ℓ_0
30 : $P_{34} = (30,1,0,0)$ lies on line ℓ_0
31 : $P_{35} = (31,1,0,0)$ lies on line ℓ_0
32 : $P_{67} = (0,1,1,0)$ lies on line ℓ_2
33 : $P_{1090} = (0,1,0,1)$ lies on line ℓ_1
34 : $P_{1122} = (0,2,0,1)$ lies on line ℓ_1
35 : $P_{1154} = (0,3,0,1)$ lies on line ℓ_1
36 : $P_{1186} = (0,4,0,1)$ lies on line ℓ_1
37 : $P_{1218} = (0,5,0,1)$ lies on line ℓ_1
38 : $P_{1250} = (0,6,0,1)$ lies on line ℓ_1
39 : $P_{1282} = (0,7,0,1)$ lies on line ℓ_1
40 : $P_{1314} = (0,8,0,1)$ lies on line ℓ_1
41 : $P_{1346} = (0,9,0,1)$ lies on line ℓ_1
42 : $P_{1378} = (0,10,0,1)$ lies on line ℓ_1
43 : $P_{1410} = (0,11,0,1)$ lies on line ℓ_1
44 : $P_{1442} = (0,12,0,1)$ lies on line ℓ_1
45 : $P_{1474} = (0,13,0,1)$ lies on line ℓ_1
46 : $P_{1506} = (0,14,0,1)$ lies on line ℓ_1
47 : $P_{1538} = (0,15,0,1)$ lies on line ℓ_1
48 : $P_{1570} = (0,16,0,1)$ lies on line ℓ_1
49 : $P_{1602} = (0,17,0,1)$ lies on line ℓ_1
50 : $P_{1634} = (0,18,0,1)$ lies on line ℓ_1
51 : $P_{1666} = (0,19,0,1)$ lies on line ℓ_1

52 : $P_{1698} = (0, 20, 0, 1)$ lies on line ℓ_1
53 : $P_{1730} = (0, 21, 0, 1)$ lies on line ℓ_1
54 : $P_{1762} = (0, 22, 0, 1)$ lies on line ℓ_1
55 : $P_{1794} = (0, 23, 0, 1)$ lies on line ℓ_1
56 : $P_{1826} = (0, 24, 0, 1)$ lies on line ℓ_1
57 : $P_{1858} = (0, 25, 0, 1)$ lies on line ℓ_1
58 : $P_{1890} = (0, 26, 0, 1)$ lies on line ℓ_1
59 : $P_{1922} = (0, 27, 0, 1)$ lies on line ℓ_1
60 : $P_{1954} = (0, 28, 0, 1)$ lies on line ℓ_1
61 : $P_{1986} = (0, 29, 0, 1)$ lies on line ℓ_1
62 : $P_{2018} = (0, 30, 0, 1)$ lies on line ℓ_1
63 : $P_{2050} = (0, 31, 0, 1)$ lies on line ℓ_1
64 : $P_{2114} = (0, 1, 1, 1)$ lies on line ℓ_2
65 : $P_{3169} = (0, 2, 2, 1)$ lies on line ℓ_2
66 : $P_{4225} = (0, 3, 3, 1)$ lies on line ℓ_2
67 : $P_{5281} = (0, 4, 4, 1)$ lies on line ℓ_2
68 : $P_{6337} = (0, 5, 5, 1)$ lies on line ℓ_2
69 : $P_{7393} = (0, 6, 6, 1)$ lies on line ℓ_2
70 : $P_{8449} = (0, 7, 7, 1)$ lies on line ℓ_2
71 : $P_{9505} = (0, 8, 8, 1)$ lies on line ℓ_2
72 : $P_{10561} = (0, 9, 9, 1)$ lies on line ℓ_2
73 : $P_{11617} = (0, 10, 10, 1)$ lies on line ℓ_2
74 : $P_{12673} = (0, 11, 11, 1)$ lies on line ℓ_2
75 : $P_{13729} = (0, 12, 12, 1)$ lies on line ℓ_2
76 : $P_{14785} = (0, 13, 13, 1)$ lies on line ℓ_2
77 : $P_{15841} = (0, 14, 14, 1)$ lies on line ℓ_2
78 : $P_{16897} = (0, 15, 15, 1)$ lies on line ℓ_2
79 : $P_{17953} = (0, 16, 16, 1)$ lies on line ℓ_2
80 : $P_{19009} = (0, 17, 17, 1)$ lies on line ℓ_2
81 : $P_{20065} = (0, 18, 18, 1)$ lies on line ℓ_2
82 : $P_{21121} = (0, 19, 19, 1)$ lies on line ℓ_2
83 : $P_{22177} = (0, 20, 20, 1)$ lies on line ℓ_2
84 : $P_{23233} = (0, 21, 21, 1)$ lies on line ℓ_2
85 : $P_{24289} = (0, 22, 22, 1)$ lies on line ℓ_2
86 : $P_{25345} = (0, 23, 23, 1)$ lies on line ℓ_2
87 : $P_{26401} = (0, 24, 24, 1)$ lies on line ℓ_2
88 : $P_{27457} = (0, 25, 25, 1)$ lies on line ℓ_2
89 : $P_{28513} = (0, 26, 26, 1)$ lies on line ℓ_2
90 : $P_{29569} = (0, 27, 27, 1)$ lies on line ℓ_2
91 : $P_{30625} = (0, 28, 28, 1)$ lies on line ℓ_2
92 : $P_{31681} = (0, 29, 29, 1)$ lies on line ℓ_2
93 : $P_{32737} = (0, 30, 30, 1)$ lies on line ℓ_2
94 : $P_{33793} = (0, 31, 31, 1)$ 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 : $P_{115} = (16, 2, 1, 0)$
2 : $P_{162} = (31, 3, 1, 0)$
3 : $P_{176} = (13, 4, 1, 0)$
4 : $P_{213} = (18, 5, 1, 0)$
5 : $P_{235} = (8, 6, 1, 0)$
6 : $P_{270} = (11, 7, 1, 0)$
7 : $P_{321} = (30, 8, 1, 0)$
8 : $P_{336} = (13, 9, 1, 0)$
9 : $P_{374} = (19, 10, 1, 0)$
10 : $P_{414} = (27, 11, 1, 0)$
11 : $P_{430} = (11, 12, 1, 0)$
12 : $P_{453} = (2, 13, 1, 0)$
13 : $P_{491} = (8, 14, 1, 0)$
14 : $P_{517} = (2, 15, 1, 0)$
15 : $P_{574} = (27, 16, 1, 0)$
16 : $P_{588} = (9, 17, 1, 0)$
17 : $P_{627} = (16, 18, 1, 0)$
18 : $P_{657} = (14, 19, 1, 0)$
19 : $P_{685} = (10, 20, 1, 0)$
20 : $P_{722} = (15, 21, 1, 0)$
21 : $P_{769} = (30, 22, 1, 0)$
22 : $P_{789} = (18, 23, 1, 0)$
23 : $P_{812} = (9, 24, 1, 0)$
24 : $P_{854} = (19, 25, 1, 0)$
25 : $P_{882} = (15, 26, 1, 0)$
26 : $P_{903} = (4, 27, 1, 0)$
27 : $P_{962} = (31, 28, 1, 0)$
28 : $P_{977} = (14, 29, 1, 0)$
29 : $P_{1005} = (10, 30, 1, 0)$
30 : $P_{1031} = (4, 31, 1, 0)$
31 : $P_{2083} = (1, 0, 1, 1)$
32 : $P_{2197} = (20, 3, 1, 1)$
33 : $P_{2200} = (23, 3, 1, 1)$
34 : $P_{2265} = (24, 5, 1, 1)$
35 : $P_{2270} = (29, 5, 1, 1)$
36 : $P_{2299} = (26, 6, 1, 1)$
37 : $P_{2301} = (28, 6, 1, 1)$
38 : $P_{2322} = (17, 7, 1, 1)$
39 : $P_{2327} = (22, 7, 1, 1)$
40 : $P_{2486} = (21, 12, 1, 1)$
41 : $P_{2490} = (25, 12, 1, 1)$
42 : $P_{2632} = (7, 17, 1, 1)$
43 : $P_{2647} = (22, 17, 1, 1)$

$44: P_{2724} = (3, 20, 1, 1)$
$45: P_{2744} = (23, 20, 1, 1)$
$46: P_{2765} = (12, 21, 1, 1)$
$47: P_{2778} = (25, 21, 1, 1)$
$48: P_{2792} = (7, 22, 1, 1)$
$49: P_{2802} = (17, 22, 1, 1)$
$50: P_{2820} = (3, 23, 1, 1)$
$51: P_{2837} = (20, 23, 1, 1)$
$52: P_{2854} = (5, 24, 1, 1)$
$53: P_{2878} = (29, 24, 1, 1)$
$54: P_{2893} = (12, 25, 1, 1)$
$55: P_{2902} = (21, 25, 1, 1)$
$56: P_{2919} = (6, 26, 1, 1)$
$57: P_{2941} = (28, 26, 1, 1)$
$58: P_{2983} = (6, 28, 1, 1)$
$59: P_{3003} = (26, 28, 1, 1)$
$60: P_{3014} = (5, 29, 1, 1)$
$61: P_{3033} = (24, 29, 1, 1)$
$62: P_{3124} = (19, 0, 2, 1)$
$63: P_{3165} = (28, 1, 2, 1)$
$64: P_{3167} = (30, 1, 2, 1)$
$65: P_{3173} = (4, 2, 2, 1)$
$66: P_{3217} = (16, 3, 2, 1)$
$67: P_{3223} = (22, 3, 2, 1)$
$68: P_{3251} = (18, 4, 2, 1)$
$69: P_{3259} = (26, 4, 2, 1)$
$70: P_{3301} = (4, 6, 2, 1)$
$71: P_{3305} = (8, 6, 2, 1)$
$72: P_{3490} = (1, 12, 2, 1)$
$73: P_{3514} = (25, 12, 2, 1)$
$74: P_{3522} = (1, 13, 2, 1)$
$75: P_{3548} = (27, 13, 2, 1)$
$76: P_{3561} = (8, 14, 2, 1)$
$77: P_{3573} = (20, 14, 2, 1)$
$78: P_{3729} = (16, 19, 2, 1)$
$79: P_{3732} = (19, 19, 2, 1)$
$80: P_{3799} = (22, 21, 2, 1)$
$81: P_{3802} = (25, 21, 2, 1)$
$82: P_{3827} = (18, 22, 2, 1)$
$83: P_{3836} = (27, 22, 2, 1)$
$84: P_{3942} = (5, 26, 2, 1)$
$85: P_{3957} = (20, 26, 2, 1)$
$86: P_{4036} = (3, 29, 2, 1)$
$87: P_{4061} = (28, 29, 2, 1)$
$88: P_{4068} = (3, 30, 2, 1)$
$89: P_{4091} = (26, 30, 2, 1)$
$90: P_{4102} = (5, 31, 2, 1)$
$91: P_{4127} = (30, 31, 2, 1)$
$92: P_{4140} = (11, 0, 3, 1)$
$93: P_{4174} = (13, 1, 3, 1)$
$94: P_{4175} = (14, 1, 3, 1)$
$95: P_{4230} = (5, 3, 3, 1)$
$96: P_{4326} = (5, 6, 3, 1)$
$97: P_{4336} = (15, 6, 3, 1)$
$98: P_{4387} = (2, 8, 3, 1)$
$99: P_{4411} = (26, 8, 3, 1)$
$100: P_{4432} = (15, 9, 3, 1)$
$101: P_{4437} = (20, 9, 3, 1)$
$102: P_{4451} = (2, 10, 3, 1)$
$103: P_{4477} = (28, 10, 3, 1)$
$104: P_{4492} = (11, 11, 3, 1)$
$105: P_{4503} = (22, 11, 3, 1)$
$106: P_{4526} = (13, 12, 3, 1)$
$107: P_{4538} = (25, 12, 3, 1)$
$108: P_{4623} = (14, 15, 3, 1)$
$109: P_{4640} = (31, 15, 3, 1)$
$110: P_{4651} = (10, 16, 3, 1)$
$111: P_{4672} = (31, 16, 3, 1)$
$112: P_{4714} = (9, 18, 3, 1)$
$113: P_{4731} = (26, 18, 3, 1)$
$114: P_{4804} = (3, 21, 3, 1)$
$115: P_{4826} = (25, 21, 3, 1)$
$116: P_{4836} = (3, 22, 3, 1)$
$117: P_{4861} = (28, 22, 3, 1)$
$118: P_{4962} = (1, 26, 3, 1)$
$119: P_{4971} = (10, 26, 3, 1)$
$120: P_{4994} = (1, 27, 3, 1)$
$121: P_{5002} = (9, 27, 3, 1)$
$122: P_{5077} = (20, 29, 3, 1)$
$123: P_{5079} = (22, 29, 3, 1)$
$124: P_{5161} = (8, 0, 4, 1)$
$125: P_{5204} = (19, 1, 4, 1)$
$126: P_{5208} = (23, 1, 4, 1)$
$127: P_{5266} = (17, 3, 4, 1)$
$128: P_{5278} = (29, 3, 4, 1)$
$129: P_{5297} = (16, 4, 4, 1)$
$130: P_{5326} = (13, 5, 4, 1)$
$131: P_{5338} = (25, 5, 4, 1)$
$132: P_{5417} = (8, 8, 4, 1)$
$133: P_{5422} = (13, 8, 4, 1)$
$134: P_{5668} = (3, 16, 4, 1)$
$135: P_{5674} = (9, 16, 4, 1)$
$136: P_{5746} = (17, 18, 4, 1)$
$137: P_{5748} = (19, 18, 4, 1)$
$138: P_{5764} = (3, 19, 4, 1)$
$139: P_{5766} = (5, 19, 4, 1)$
$140: P_{5803} = (10, 20, 4, 1)$
$141: P_{5809} = (16, 20, 4, 1)$
$142: P_{5862} = (5, 22, 4, 1)$
$143: P_{5880} = (23, 22, 4, 1)$
$144: P_{5955} = (2, 25, 4, 1)$
$145: P_{5962} = (9, 25, 4, 1)$
$146: P_{5986} = (1, 26, 4, 1)$
$147: P_{5991} = (6, 26, 4, 1)$
$148: P_{6018} = (1, 27, 4, 1)$
$149: P_{6019} = (2, 27, 4, 1)$
$150: P_{6055} = (6, 28, 4, 1)$
$151: P_{6074} = (25, 28, 4, 1)$

$152: P_{6123} = (10, 30, 4, 1)$
$153: P_{6142} = (29, 30, 4, 1)$
$154: P_{6192} = (15, 0, 5, 1)$
$155: P_{6236} = (27, 1, 5, 1)$
$156: P_{6239} = (30, 1, 5, 1)$
$157: P_{6242} = (1, 2, 5, 1)$
$158: P_{6252} = (11, 2, 5, 1)$
$159: P_{6274} = (1, 3, 5, 1)$
$160: P_{6287} = (14, 3, 5, 1)$
$161: P_{6354} = (17, 5, 5, 1)$
$162: P_{6468} = (3, 9, 5, 1)$
$163: P_{6476} = (11, 9, 5, 1)$
$164: P_{6500} = (3, 10, 5, 1)$
$165: P_{6501} = (4, 10, 5, 1)$
$166: P_{6558} = (29, 11, 5, 1)$
$167: P_{6560} = (31, 11, 5, 1)$
$168: P_{6607} = (14, 13, 5, 1)$
$169: P_{6611} = (18, 13, 5, 1)$
$170: P_{6629} = (4, 14, 5, 1)$
$171: P_{6648} = (23, 14, 5, 1)$
$172: P_{6672} = (15, 15, 5, 1)$
$173: P_{6682} = (25, 15, 5, 1)$
$174: P_{6834} = (17, 20, 5, 1)$
$175: P_{6848} = (31, 20, 5, 1)$
$176: P_{6906} = (25, 22, 5, 1)$
$177: P_{6910} = (29, 22, 5, 1)$
$178: P_{6982} = (5, 25, 5, 1)$
$179: P_{7000} = (23, 25, 5, 1)$
$180: P_{7015} = (6, 26, 5, 1)$
$181: P_{7036} = (27, 26, 5, 1)$
$182: P_{7078} = (5, 28, 5, 1)$
$183: P_{7079} = (6, 28, 5, 1)$
$184: P_{7187} = (18, 31, 5, 1)$
$185: P_{7199} = (30, 31, 5, 1)$
$186: P_{7229} = (28, 0, 6, 1)$
$187: P_{7283} = (18, 2, 6, 1)$
$188: P_{7295} = (30, 2, 6, 1)$
$189: P_{7370} = (9, 5, 6, 1)$
$190: P_{7384} = (23, 5, 6, 1)$
$191: P_{7413} = (20, 6, 6, 1)$
$192: P_{7461} = (4, 8, 6, 1)$
$193: P_{7474} = (17, 8, 6, 1)$
$194: P_{7589} = (4, 12, 6, 1)$
$195: P_{7594} = (9, 12, 6, 1)$
$196: P_{7639} = (22, 13, 6, 1)$
$197: P_{7646} = (29, 13, 6, 1)$
$198: P_{7675} = (26, 14, 6, 1)$
$199: P_{7676} = (27, 14, 6, 1)$
$200: P_{7731} = (18, 16, 6, 1)$
$201: P_{7742} = (29, 16, 6, 1)$
$202: P_{7797} = (20, 18, 6, 1)$
$203: P_{7800} = (23, 18, 6, 1)$
$204: P_{7854} = (13, 20, 6, 1)$
$205: P_{7867} = (26, 20, 6, 1)$
$206: P_{7883} = (10, 21, 6, 1)$
$207: P_{7900} = (27, 21, 6, 1)$
$208: P_{8014} = (13, 25, 6, 1)$
$209: P_{8018} = (17, 25, 6, 1)$
$210: P_{8071} = (6, 27, 6, 1)$
$211: P_{8087} = (22, 27, 6, 1)$
$212: P_{8125} = (28, 28, 6, 1)$
$213: P_{8127} = (30, 28, 6, 1)$
$214: P_{8131} = (2, 29, 6, 1)$
$215: P_{8135} = (6, 29, 6, 1)$
$216: P_{8195} = (2, 31, 6, 1)$
$217: P_{8203} = (10, 31, 6, 1)$
$218: P_{8227} = (2, 0, 7, 1)$
$219: P_{8282} = (25, 1, 7, 1)$
$220: P_{8287} = (30, 1, 7, 1)$
$221: P_{8291} = (2, 2, 7, 1)$
$222: P_{8301} = (12, 2, 7, 1)$
$223: P_{8339} = (18, 3, 7, 1)$
$224: P_{8348} = (27, 3, 7, 1)$
$225: P_{8470} = (21, 7, 7, 1)$
$226: P_{8486} = (5, 8, 7, 1)$
$227: P_{8505} = (24, 8, 7, 1)$
$228: P_{8644} = (3, 13, 7, 1)$
$229: P_{8646} = (5, 13, 7, 1)$
$230: P_{8676} = (3, 14, 7, 1)$
$231: P_{8685} = (12, 14, 7, 1)$
$232: P_{8744} = (7, 16, 7, 1)$
$233: P_{8761} = (24, 16, 7, 1)$
$234: P_{8779} = (10, 17, 7, 1)$
$235: P_{8787} = (18, 17, 7, 1)$
$236: P_{8805} = (4, 18, 7, 1)$
$237: P_{8822} = (21, 18, 7, 1)$
$238: P_{8933} = (4, 22, 7, 1)$
$239: P_{8938} = (9, 22, 7, 1)$
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646 : $P_{22565} = (4, 0, 21, 1)$
647 : $P_{22599} = (6, 1, 21, 1)$
648 : $P_{22612} = (19, 1, 21, 1)$
649 : $P_{22626} = (1, 2, 21, 1)$
650 : $P_{22639} = (14, 2, 21, 1)$
651 : $P_{22658} = (1, 3, 21, 1)$
652 : $P_{22684} = (27, 3, 21, 1)$
653 : $P_{22693} = (4, 4, 21, 1)$
654 : $P_{22715} = (26, 4, 21, 1)$
655 : $P_{22723} = (2, 5, 21, 1)$
656 : $P_{22730} = (9, 5, 21, 1)$
657 : $P_{22787} = (2, 7, 21, 1)$
658 : $P_{22791} = (6, 7, 21, 1)$
659 : $P_{22865} = (16, 9, 21, 1)$
660 : $P_{22877} = (28, 9, 21, 1)$
661 : $P_{22888} = (7, 10, 21, 1)$
662 : $P_{22898} = (17, 10, 21, 1)$
663 : $P_{22954} = (9, 12, 21, 1)$
664 : $P_{22959} = (14, 12, 21, 1)$
665 : $P_{22984} = (7, 13, 21, 1)$
666 : $P_{22998} = (21, 13, 21, 1)$
667 : $P_{23148} = (11, 18, 21, 1)$
668 : $P_{23156} = (19, 18, 21, 1)$
669 : $P_{23261} = (28, 21, 21, 1)$
670 : $P_{23350} = (21, 24, 21, 1)$
671 : $P_{23356} = (27, 24, 21, 1)$
672 : $P_{23372} = (11, 25, 21, 1)$
673 : $P_{23377} = (16, 25, 21, 1)$
674 : $P_{23430} = (5, 27, 21, 1)$
675 : $P_{23442} = (17, 27, 21, 1)$
676 : $P_{23526} = (5, 30, 21, 1)$
677 : $P_{23547} = (26, 30, 21, 1)$
678 : $P_{23592} = (7, 0, 22, 1)$
679 : $P_{23655} = (6, 2, 22, 1)$
680 : $P_{23664} = (15, 2, 22, 1)$
681 : $P_{23719} = (6, 4, 22, 1)$
682 : $P_{23733} = (20, 4, 22, 1)$
683 : $P_{23772} = (27, 5, 22, 1)$
684 : $P_{23776} = (31, 5, 22, 1)$
685 : $P_{23790} = (13, 6, 22, 1)$
686 : $P_{23799} = (22, 6, 22, 1)$
687 : $P_{23816} = (7, 7, 22, 1)$
688 : $P_{23819} = (10, 7, 22, 1)$
689 : $P_{23857} = (16, 8, 22, 1)$
690 : $P_{23858} = (17, 8, 22, 1)$
691 : $P_{23950} = (13, 11, 22, 1)$

692 : $P_{23956} = (19, 11, 22, 1)$
693 : $P_{24011} = (10, 13, 22, 1)$
694 : $P_{24016} = (15, 13, 22, 1)$
695 : $P_{24086} = (21, 15, 22, 1)$
696 : $P_{24090} = (25, 15, 22, 1)$
697 : $P_{24117} = (20, 16, 22, 1)$
698 : $P_{24119} = (22, 16, 22, 1)$
699 : $P_{24314} = (25, 22, 22, 1)$
700 : $P_{24369} = (16, 24, 22, 1)$
701 : $P_{24372} = (19, 24, 22, 1)$
702 : $P_{24389} = (4, 25, 22, 1)$
703 : $P_{24402} = (17, 25, 22, 1)$
704 : $P_{24438} = (21, 26, 22, 1)$
705 : $P_{24448} = (31, 26, 22, 1)$
706 : $P_{24516} = (3, 29, 22, 1)$
707 : $P_{24517} = (4, 29, 22, 1)$
708 : $P_{24548} = (3, 30, 22, 1)$
709 : $P_{24572} = (27, 30, 22, 1)$
710 : $P_{24622} = (13, 0, 23, 1)$
711 : $P_{24651} = (10, 1, 23, 1)$
712 : $P_{24670} = (29, 1, 23, 1)$
713 : $P_{24696} = (23, 2, 23, 1)$
714 : $P_{24701} = (28, 2, 23, 1)$
715 : $P_{24720} = (15, 3, 23, 1)$
716 : $P_{24724} = (19, 3, 23, 1)$
717 : $P_{24749} = (12, 4, 23, 1)$
718 : $P_{24763} = (26, 4, 23, 1)$
719 : $P_{24870} = (5, 8, 23, 1)$
720 : $P_{24877} = (12, 8, 23, 1)$
721 : $P_{24971} = (10, 11, 23, 1)$
722 : $P_{24992} = (31, 11, 23, 1)$
723 : $P_{25008} = (15, 12, 23, 1)$
724 : $P_{25009} = (16, 12, 23, 1)$
725 : $P_{25030} = (5, 13, 23, 1)$
726 : $P_{25038} = (13, 13, 23, 1)$
727 : $P_{25113} = (24, 15, 23, 1)$
728 : $P_{25116} = (27, 15, 23, 1)$
729 : $P_{25122} = (1, 16, 23, 1)$
730 : $P_{25140} = (19, 16, 23, 1)$
731 : $P_{25154} = (1, 17, 23, 1)$
732 : $P_{25157} = (4, 17, 23, 1)$
733 : $P_{25276} = (27, 20, 23, 1)$
734 : $P_{25280} = (31, 20, 23, 1)$
735 : $P_{25285} = (4, 21, 23, 1)$
736 : $P_{25304} = (23, 21, 23, 1)$
737 : $P_{25369} = (24, 23, 23, 1)$
738 : $P_{25521} = (16, 28, 23, 1)$
739 : $P_{25534} = (29, 28, 23, 1)$
740 : $P_{25595} = (26, 30, 23, 1)$
741 : $P_{25597} = (28, 30, 23, 1)$
742 : $P_{25660} = (27, 0, 24, 1)$
743 : $P_{25679} = (14, 1, 24, 1)$
744 : $P_{25687} = (22, 1, 24, 1)$
745 : $P_{25784} = (23, 4, 24, 1)$
746 : $P_{25785} = (24, 4, 24, 1)$
747 : $P_{25801} = (8, 5, 24, 1)$
748 : $P_{25824} = (31, 5, 24, 1)$
749 : $P_{25970} = (17, 10, 24, 1)$
750 : $P_{25979} = (26, 10, 24, 1)$
751 : $P_{26018} = (1, 12, 24, 1)$
752 : $P_{26033} = (16, 12, 24, 1)$
753 : $P_{26050} = (1, 13, 24, 1)$
754 : $P_{26057} = (8, 13, 24, 1)$
755 : $P_{26127} = (14, 15, 24, 1)$
756 : $P_{26131} = (18, 15, 24, 1)$
757 : $P_{26148} = (3, 16, 24, 1)$
758 : $P_{26171} = (26, 16, 24, 1)$
759 : $P_{26244} = (3, 19, 24, 1)$
760 : $P_{26264} = (23, 19, 24, 1)$
761 : $P_{26382} = (13, 23, 24, 1)$
762 : $P_{26391} = (22, 23, 24, 1)$
763 : $P_{26408} = (7, 24, 24, 1)$
764 : $P_{26478} = (13, 26, 24, 1)$
765 : $P_{26496} = (31, 26, 24, 1)$
766 : $P_{26514} = (17, 27, 24, 1)$
767 : $P_{26524} = (27, 27, 24, 1)$
768 : $P_{26545} = (16, 28, 24, 1)$
769 : $P_{26553} = (24, 28, 24, 1)$
770 : $P_{26563} = (2, 29, 24, 1)$
771 : $P_{26579} = (18, 29, 24, 1)$
772 : $P_{26627} = (2, 31, 24, 1)$
773 : $P_{26632} = (7, 31, 24, 1)$
774 : $P_{26678} = (21, 0, 25, 1)$
775 : $P_{26771} = (18, 3, 25, 1)$
776 : $P_{26781} = (28, 3, 25, 1)$
777 : $P_{26805} = (20, 4, 25, 1)$
778 : $P_{26816} = (31, 4, 25, 1)$
779 : $P_{26861} = (12, 6, 25, 1)$
780 : $P_{26865} = (16, 6, 25, 1)$
781 : $P_{26889} = (8, 7, 25, 1)$
782 : $P_{26894} = (13, 7, 25, 1)$
783 : $P_{26989} = (12, 10, 25, 1)$
784 : $P_{26990} = (13, 10, 25, 1)$
785 : $P_{27098} = (25, 13, 25, 1)$
786 : $P_{27102} = (29, 13, 25, 1)$
787 : $P_{27145} = (8, 15, 25, 1)$
788 : $P_{27164} = (27, 15, 25, 1)$
789 : $P_{27189} = (20, 16, 25, 1)$
790 : $P_{27198} = (29, 16, 25, 1)$
791 : $P_{27203} = (2, 17, 25, 1)$
792 : $P_{27219} = (18, 17, 25, 1)$
793 : $P_{27267} = (2, 19, 25, 1)$
794 : $P_{27270} = (5, 19, 25, 1)$
795 : $P_{27322} = (25, 20, 25, 1)$
796 : $P_{27324} = (27, 20, 25, 1)$
797 : $P_{27343} = (14, 21, 25, 1)$
798 : $P_{27350} = (21, 21, 25, 1)$
799 : $P_{27366} = (5, 22, 25, 1)$

800 : $P_{27377} = (16, 22, 25, 1)$
801 : $P_{27463} = (6, 25, 25, 1)$
802 : $P_{27535} = (14, 27, 25, 1)$
803 : $P_{27552} = (31, 27, 25, 1)$
804 : $P_{27655} = (6, 31, 25, 1)$
805 : $P_{27677} = (28, 31, 25, 1)$
806 : $P_{27690} = (9, 0, 26, 1)$
807 : $P_{27723} = (10, 1, 26, 1)$
808 : $P_{27729} = (16, 1, 26, 1)$
809 : $P_{27817} = (8, 4, 26, 1)$
810 : $P_{27824} = (15, 4, 26, 1)$
811 : $P_{27927} = (22, 7, 26, 1)$
812 : $P_{27931} = (26, 7, 26, 1)$
813 : $P_{27958} = (21, 8, 26, 1)$
814 : $P_{27964} = (27, 8, 26, 1)$
815 : $P_{27978} = (9, 9, 26, 1)$
816 : $P_{27998} = (29, 9, 26, 1)$
817 : $P_{28043} = (10, 11, 26, 1)$
818 : $P_{28048} = (15, 11, 26, 1)$
819 : $P_{28066} = (1, 12, 26, 1)$
820 : $P_{28073} = (8, 12, 26, 1)$
821 : $P_{28098} = (1, 13, 26, 1)$
822 : $P_{28115} = (18, 13, 26, 1)$
823 : $P_{28241} = (16, 17, 26, 1)$
824 : $P_{28247} = (22, 17, 26, 1)$
825 : $P_{28263} = (6, 18, 26, 1)$
826 : $P_{28268} = (11, 18, 26, 1)$
827 : $P_{28301} = (12, 19, 26, 1)$
828 : $P_{28316} = (27, 19, 26, 1)$
829 : $P_{28327} = (6, 20, 26, 1)$
830 : $P_{28350} = (29, 20, 26, 1)$
831 : $P_{28484} = (3, 25, 26, 1)$
832 : $P_{28492} = (11, 25, 26, 1)$
833 : $P_{28516} = (3, 26, 26, 1)$
834 : $P_{28630} = (21, 29, 26, 1)$
835 : $P_{28635} = (26, 29, 26, 1)$
836 : $P_{28685} = (12, 31, 26, 1)$
837 : $P_{28691} = (18, 31, 26, 1)$
838 : $P_{28735} = (30, 0, 27, 1)$
839 : $P_{28751} = (14, 1, 27, 1)$
840 : $P_{28758} = (21, 1, 27, 1)$
841 : $P_{28781} = (12, 2, 27, 1)$
842 : $P_{28800} = (31, 2, 27, 1)$
843 : $P_{28951} = (22, 7, 27, 1)$
844 : $P_{28958} = (29, 7, 27, 1)$
845 : $P_{29031} = (6, 10, 27, 1)$
846 : $P_{29044} = (19, 10, 27, 1)$
847 : $P_{29092} = (3, 12, 27, 1)$
848 : $P_{29095} = (6, 12, 27, 1)$
849 : $P_{29165} = (12, 14, 27, 1)$
850 : $P_{29179} = (26, 14, 27, 1)$
851 : $P_{29188} = (3, 15, 27, 1)$
852 : $P_{29199} = (14, 15, 27, 1)$
853 : $P_{29218} = (1, 16, 27, 1)$
854 : $P_{29230} = (13, 16, 27, 1)$
855 : $P_{29250} = (1, 17, 27, 1)$
856 : $P_{29271} = (22, 17, 27, 1)$
857 : $P_{29366} = (21, 20, 27, 1)$
858 : $P_{29371} = (26, 20, 27, 1)$
859 : $P_{29507} = (2, 25, 27, 1)$
860 : $P_{29524} = (19, 25, 27, 1)$
861 : $P_{29541} = (4, 26, 27, 1)$
862 : $P_{29566} = (29, 26, 27, 1)$
863 : $P_{29571} = (2, 27, 27, 1)$
864 : $P_{29646} = (13, 29, 27, 1)$
865 : $P_{29664} = (31, 29, 27, 1)$
866 : $P_{29669} = (4, 30, 27, 1)$
867 : $P_{29695} = (30, 30, 27, 1)$
868 : $P_{29745} = (16, 0, 28, 1)$
869 : $P_{29769} = (8, 1, 28, 1)$
870 : $P_{29781} = (20, 1, 28, 1)$
871 : $P_{29805} = (12, 2, 28, 1)$
872 : $P_{29810} = (17, 2, 28, 1)$
873 : $P_{29858} = (1, 4, 28, 1)$
874 : $P_{29887} = (30, 4, 28, 1)$
875 : $P_{29890} = (1, 5, 28, 1)$
876 : $P_{29891} = (2, 5, 28, 1)$
877 : $P_{29934} = (13, 6, 28, 1)$
878 : $P_{29936} = (15, 6, 28, 1)$
879 : $P_{29955} = (2, 7, 28, 1)$
880 : $P_{29981} = (28, 7, 28, 1)$
881 : $P_{30025} = (8, 9, 28, 1)$
882 : $P_{30032} = (15, 9, 28, 1)$
883 : $P_{30094} = (13, 11, 28, 1)$
884 : $P_{30104} = (23, 11, 28, 1)$
885 : $P_{30189} = (12, 14, 28, 1)$
886 : $P_{30198} = (21, 14, 28, 1)$
887 : $P_{30244} = (3, 16, 28, 1)$
888 : $P_{30257} = (16, 16, 28, 1)$
889 : $P_{30277} = (4, 17, 28, 1)$
890 : $P_{30284} = (11, 17, 28, 1)$
891 : $P_{30340} = (3, 19, 28, 1)$
892 : $P_{30354} = (17, 19, 28, 1)$
893 : $P_{30405} = (4, 21, 28, 1)$
894 : $P_{30421} = (20, 21, 28, 1)$
895 : $P_{30572} = (11, 26, 28, 1)$
896 : $P_{30591} = (30, 26, 28, 1)$
897 : $P_{30614} = (21, 27, 28, 1)$
898 : $P_{30621} = (28, 27, 28, 1)$
899 : $P_{30648} = (23, 28, 28, 1)$
900 : $P_{30777} = (24, 0, 29, 1)$
901 : $P_{30823} = (6, 2, 29, 1)$
902 : $P_{30842} = (25, 2, 29, 1)$
903 : $P_{30862} = (13, 3, 29, 1)$
904 : $P_{30864} = (15, 3, 29, 1)$
905 : $P_{30887} = (6, 4, 29, 1)$
906 : $P_{30910} = (29, 4, 29, 1)$
907 : $P_{31057} = (16, 9, 29, 1)$

908 : $P_{31071} = (30, 9, 29, 1)$
909 : $P_{31112} = (7, 11, 29, 1)$
910 : $P_{31127} = (22, 11, 29, 1)$
911 : $P_{31144} = (7, 12, 29, 1)$
912 : $P_{31152} = (15, 12, 29, 1)$
913 : $P_{31214} = (13, 14, 29, 1)$
914 : $P_{31227} = (26, 14, 29, 1)$
915 : $P_{31273} = (8, 16, 29, 1)$
916 : $P_{31276} = (11, 16, 29, 1)$
917 : $P_{31365} = (4, 19, 29, 1)$
918 : $P_{31366} = (5, 19, 29, 1)$
919 : $P_{31395} = (2, 20, 29, 1)$
920 : $P_{31419} = (26, 20, 29, 1)$
921 : $P_{31459} = (2, 22, 29, 1)$
922 : $P_{31462} = (5, 22, 29, 1)$
923 : $P_{31493} = (4, 23, 29, 1)$
924 : $P_{31519} = (30, 23, 29, 1)$
925 : $P_{31529} = (8, 24, 29, 1)$
926 : $P_{31545} = (24, 24, 29, 1)$
927 : $P_{31569} = (16, 25, 29, 1)$
928 : $P_{31582} = (29, 25, 29, 1)$
929 : $P_{31628} = (11, 27, 29, 1)$
930 : $P_{31642} = (25, 27, 29, 1)$
931 : $P_{31703} = (22, 29, 29, 1)$
932 : $P_{31782} = (5, 0, 30, 1)$
933 : $P_{31891} = (18, 3, 30, 1)$
934 : $P_{31894} = (21, 3, 30, 1)$
935 : $P_{31942} = (5, 5, 30, 1)$
936 : $P_{31949} = (12, 5, 30, 1)$
937 : $P_{32012} = (11, 7, 30, 1)$
938 : $P_{32028} = (27, 7, 30, 1)$
939 : $P_{32077} = (12, 9, 30, 1)$
940 : $P_{32090} = (25, 9, 30, 1)$
941 : $P_{32151} = (22, 11, 30, 1)$
942 : $P_{32155} = (26, 11, 30, 1)$
943 : $P_{32172} = (11, 12, 30, 1)$
944 : $P_{32184} = (23, 12, 30, 1)$
945 : $P_{32210} = (17, 13, 30, 1)$
946 : $P_{32212} = (19, 13, 30, 1)$
947 : $P_{32304} = (15, 16, 30, 1)$
948 : $P_{32314} = (25, 16, 30, 1)$
949 : $P_{32339} = (18, 17, 30, 1)$
950 : $P_{32347} = (26, 17, 30, 1)$
951 : $P_{32494} = (13, 22, 30, 1)$
952 : $P_{32502} = (21, 22, 30, 1)$
953 : $P_{32654} = (13, 27, 30, 1)$
954 : $P_{32664} = (23, 27, 30, 1)$
955 : $P_{32690} = (17, 28, 30, 1)$
956 : $P_{32700} = (27, 28, 30, 1)$
957 : $P_{32707} = (2, 29, 30, 1)$
958 : $P_{32727} = (22, 29, 30, 1)$
959 : $P_{32756} = (19, 30, 30, 1)$
960 : $P_{32771} = (2, 31, 30, 1)$
961 : $P_{32784} = (15, 31, 30, 1)$
962 : $P_{32821} = (20, 0, 31, 1)$
963 : $P_{32840} = (7, 1, 31, 1)$
964 : $P_{32857} = (24, 1, 31, 1)$
965 : $P_{33000} = (7, 6, 31, 1)$
966 : $P_{33008} = (15, 6, 31, 1)$
967 : $P_{33104} = (15, 9, 31, 1)$
968 : $P_{33108} = (19, 9, 31, 1)$
969 : $P_{33180} = (27, 11, 31, 1)$
970 : $P_{33181} = (28, 11, 31, 1)$
971 : $P_{33235} = (18, 13, 31, 1)$
972 : $P_{33246} = (29, 13, 31, 1)$
973 : $P_{33340} = (27, 16, 31, 1)$
974 : $P_{33342} = (29, 16, 31, 1)$
975 : $P_{33442} = (1, 20, 31, 1)$
976 : $P_{33461} = (20, 20, 31, 1)$
977 : $P_{33474} = (1, 21, 31, 1)$
978 : $P_{33484} = (11, 21, 31, 1)$
979 : $P_{33550} = (13, 23, 31, 1)$
980 : $P_{33565} = (28, 23, 31, 1)$
981 : $P_{33572} = (3, 24, 31, 1)$
982 : $P_{33575} = (6, 24, 31, 1)$
983 : $P_{33603} = (2, 25, 31, 1)$
984 : $P_{33625} = (24, 25, 31, 1)$
985 : $P_{33646} = (13, 26, 31, 1)$
986 : $P_{33652} = (19, 26, 31, 1)$
987 : $P_{33667} = (2, 27, 31, 1)$
988 : $P_{33668} = (3, 27, 31, 1)$
989 : $P_{33767} = (6, 30, 31, 1)$
990 : $P_{33772} = (11, 30, 31, 1)$
991 : $P_{33811} = (18, 31, 31, 1)$

Line Intersection Graph

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

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1
in point	P_1

Line 1 intersects

Line	ℓ_0	ℓ_2
in point	P_1	P_3

Line 2 intersects

Line	ℓ_1
in point	P_3

The surface has 1089 points:
Too many to print.