# Rank-74280 over GF(8)

January 15, 2021

## The equation

The equation of the surface is :

$$X_0^3 + X_2^3 + X_0^2X_2 + X_1^2X_3 + X_0X_3^2 + X_0X_1X_2 = 0$$

( 1, 0, 1, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0 )
The point rank of the equation over GF(8) is 1361384078

## General information

| | |
|---|---|
| Number of lines | 0 |
| Number of points | 49 |
| Number of singular points | 0 |
| Number of Eckardt points | 0 |
| Number of double points | 0 |
| Number of single points | 0 |
| Number of points off lines | 49 |
| Number of Hesse planes | 0 |
| Number of axes | 0 |
| Type of points on lines | |
| Type of lines on points | $0^{49}$ |

### Singular Points

The surface has 0 singular points:

## The 0 Lines

The lines and their Pluecker coordinates are:
Rank of lines: ( )
Rank of points on Klein quadric: ( )

### Eckardt Points

The surface has 0 Eckardt points:

### Double Points

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

### Single Points

The surface has 0 single points:
The single points on the surface are:

The single points on the surface are:

### Points on surface but on no line

The surface has 49 points not on any line:
The points on the surface but not on lines are:

$0: P_1 = (0,1,0,0)$
$1: P_3 = (0,0,0,1)$
$2: P_4 = (1,1,1,1)$
$3: P_{13} = (2,0,1,0)$
$4: P_{15} = (4,0,1,0)$
$5: P_{18} = (7,0,1,0)$
$6: P_{20} = (1,1,1,0)$
$7: P_{30} = (3,2,1,0)$
$8: P_{48} = (5,4,1,0)$
$9: P_{73} = (6,7,1,0)$
$10: P_{75} = (1,0,0,1)$
$11: P_{85} = (3,1,0,1)$
$12: P_{87} = (5,1,0,1)$
$13: P_{88} = (6,1,0,1)$
$14: P_{97} = (7,2,0,1)$
$15: P_{108} = (2,4,0,1)$
$16: P_{134} = (4,7,0,1)$
$17: P_{139} = (1,0,1,1)$
$18: P_{146} = (0,1,1,1)$
$19: P_{160} = (7,2,1,1)$
$20: P_{165} = (4,3,1,1)$
$21: P_{171} = (2,4,1,1)$
$22: P_{184} = (7,5,1,1)$
$23: P_{187} = (2,6,1,1)$
$24: P_{197} = (4,7,1,1)$
$25: P_{213} = (4,1,2,1)$
$26: P_{225} = (0,3,2,1)$
$27: P_{237} = (4,4,2,1)$
$28: P_{272} = (7,0,3,1)$
$29: P_{279} = (6,1,3,1)$
$30: P_{304} = (7,4,3,1)$
$31: P_{319} = (6,6,3,1)$
$32: P_{321} = (0,7,3,1)$
$33: P_{344} = (7,1,4,1)$
$34: P_{369} = (0,5,4,1)$
$35: P_{392} = (7,7,4,1)$
$36: P_{395} = (2,0,5,1)$
$37: P_{404} = (3,1,5,1)$
$38: P_{409} = (0,2,5,1)$
$39: P_{420} = (3,3,5,1)$
$40: P_{451} = (2,7,5,1)$
$41: P_{461} = (4,0,6,1)$
$42: P_{470} = (5,1,6,1)$
$43: P_{477} = (4,2,6,1)$
$44: P_{489} = (0,4,6,1)$
$45: P_{502} = (5,5,6,1)$
$46: P_{531} = (2,1,7,1)$
$47: P_{539} = (2,2,7,1)$
$48: P_{569} = (0,6,7,1)$

## Line Intersection Graph

Neighbor sets in the line intersection graph:
The surface has 49 points:
The points on the surface are:

0 : $P_1 = (0, 1, 0, 0)$
1 : $P_3 = (0, 0, 0, 1)$
2 : $P_4 = (1, 1, 1, 1)$
3 : $P_{13} = (2, 0, 1, 0)$
4 : $P_{15} = (4, 0, 1, 0)$
5 : $P_{18} = (7, 0, 1, 0)$
6 : $P_{20} = (1, 1, 1, 0)$
7 : $P_{30} = (3, 2, 1, 0)$
8 : $P_{48} = (5, 4, 1, 0)$
9 : $P_{73} = (6, 7, 1, 0)$
10 : $P_{75} = (1, 0, 0, 1)$
11 : $P_{85} = (3, 1, 0, 1)$
12 : $P_{87} = (5, 1, 0, 1)$
13 : $P_{88} = (6, 1, 0, 1)$
14 : $P_{97} = (7, 2, 0, 1)$
15 : $P_{108} = (2, 4, 0, 1)$
16 : $P_{134} = (4, 7, 0, 1)$
17 : $P_{139} = (1, 0, 1, 1)$
18 : $P_{146} = (0, 1, 1, 1)$
19 : $P_{160} = (7, 2, 1, 1)$
20 : $P_{165} = (4, 3, 1, 1)$
21 : $P_{171} = (2, 4, 1, 1)$
22 : $P_{184} = (7, 5, 1, 1)$
23 : $P_{187} = (2, 6, 1, 1)$
24 : $P_{197} = (4, 7, 1, 1)$
25 : $P_{213} = (4, 1, 2, 1)$
26 : $P_{225} = (0, 3, 2, 1)$
27 : $P_{237} = (4, 4, 2, 1)$
28 : $P_{272} = (7, 0, 3, 1)$
29 : $P_{279} = (6, 1, 3, 1)$
30 : $P_{304} = (7, 4, 3, 1)$
31 : $P_{319} = (6, 6, 3, 1)$
32 : $P_{321} = (0, 7, 3, 1)$
33 : $P_{344} = (7, 1, 4, 1)$
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36 : $P_{395} = (2, 0, 5, 1)$
37 : $P_{404} = (3, 1, 5, 1)$
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46 : $P_{531} = (2, 1, 7, 1)$
47 : $P_{539} = (2, 2, 7, 1)$
48 : $P_{569} = (0, 6, 7, 1)$