BLT-sets of Q(4, 13)

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There are 3 BLT-sets.

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The BLT-Sets

3.1 Isomorphism Type 0

Stabilizer has order 61152
Plane intersection type is 14
Plane invariant is

$$\begin{bmatrix} 14 \end{bmatrix}$$

$\rightarrow$	1_1
14_0	1

$\downarrow$	1_1
14_0	14

$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}_{14}$
$C_1 = \{0\}_1$

$\rightarrow$	1_1
14_0	1

$\downarrow$	1_1
14_0	14

$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}_{14}$
$C_1 = \{0\}_1$
Column cell 1:
Order of the group that is induced on the object is 2184
Number of ancestors on 5-sets is 3.
Number of orbits on 5-sets is 3.
With 1 orbits on the object
Orbit lengths: 14
The points by ranks:

i	Rank
0	0
1	1
2	64
3	65

i	Rank
4	66
5	70
6	72
7	67

i	Rank
8	68
9	69
10	71
11	73

i	Rank
12	74
13	75

The points:

$$P_0 = (0, 1, 0, 0, 0)P_1 = (0, 0, 1, 0, 0)P_2 = (0, 1, 6, 12, 6)P_3 = (0, 1, 8, 6, 3)$$

$$P_4 = (0, 1, 5, 4, 2)P_5 = (0, 1, 11, 11, 12)P_6 = (0, 1, 2, 10, 5)P_7 = (0, 1, 2, 3, 8)$$

$$P_8 = (0, 1, 7, 5, 9)P_9 = (0, 1, 11, 2, 1)P_{10} = (0, 1, 7, 8, 4)P_{11} = (0, 1, 5, 9, 11)$$

$$P_{12} = (0, 1, 8, 7, 10)P_{13} = (0, 1, 6, 1, 7)$$

Stabilizer of order 61152 is generated by:

$$g_1 = \begin{bmatrix} 7 & 0 & 0 & 0 & 0 \\ 0 & 6 & 0 & 0 & 0 \\ 0 & 0 & 6 & 0 & 0 \\ 0 & 0 & 0 & 6 & 0 \\ 0 & 0 & 0 & 0 & 6 \end{bmatrix}$$

with 196 fixed points

$$g_2 = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 6 & 0 & 0 & 0 \\ 0 & 0 & 11 & 0 & 0 \\ 0 & 0 & 0 & 12 & 0 \\ 0 & 0 & 0 & 0 & 12 \end{bmatrix}$$

with 4 fixed points

$$g_3 = \begin{bmatrix} 9 & 0 & 0 & 12 & 7 \\ 0 & 10 & 0 & 0 & 0 \\ 0 & 0 & 10 & 0 & 0 \\ 10 & 0 & 0 & 7 & 8 \\ 6 & 0 & 0 & 6 & 7 \end{bmatrix}$$

with 170 fixed points

$$g_4 = \begin{bmatrix} 1 & 0 & 0 & 3 & 5 \\ 0 & 4 & 0 & 0 & 0 \\ 0 & 0 & 4 & 0 & 0 \\ 4 & 0 & 0 & 9 & 4 \\ 5 & 0 & 0 & 3 & 9 \end{bmatrix}$$

with 14 fixed points

$$g_5 = \begin{bmatrix} 3 & 0 & 0 & 7 & 3 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 3 & 2 & 12 & 6 \\ 5 & 6 & 0 & 7 & 2 \\ 3 & 12 & 0 & 8 & 7 \end{bmatrix}$$

with 2 fixed points

$$g_6 = \begin{bmatrix} 11 & 0 & 0 & 9 & 2 \\ 0 & 10 & 8 & 3 & 8 \\ 0 & 11 & 10 & 1 & 7 \\ 1 & 7 & 8 & 12 & 5 \\ 11 & 1 & 3 & 7 & 12 \end{bmatrix}$$

with 14 fixed points

3.2 Isomorphism Type 1

Stabilizer has order 392
Plane intersection type is $7^2\ 3^{294}$
Plane invariant is

$$\begin{bmatrix} 7 & 0 \\ 0 & 7 \end{bmatrix}$$

$\rightarrow$	2_1
14_0	1

$\downarrow$	2_1
14_0	7

$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}_{14}$
$C_1 = \{0, 1\}_2$

$\rightarrow$	2_1
14_0	1

$\downarrow$	2_1
14_0	7

$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}_{14}$
$C_1 = \{0, 1\}_2$
Column cell 1:
Order of the group that is induced on the object is 392
Number of ancestors on 5-sets is 19.
Number of orbits on 5-sets is 19.
With 1 orbits on the object
Orbit lengths: 14
The points by ranks:

i	Rank
0	0
1	1
2	64
3	65

i	Rank
4	66
5	70
6	72
7	1076

i	Rank
8	1604
9	1398
10	1773
11	1641

i	Rank
12	2190
13	1130

The points:

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

Stabilizer of order 392 is generated by:

$$g_1 = \begin{bmatrix} 9 & 0 & 0 & 1 & 6 \\ 0 & 10 & 0 & 0 & 0 \\ 0 & 0 & 10 & 0 & 0 \\ 3 & 0 & 0 & 7 & 8 \\ 7 & 0 & 0 & 6 & 7 \end{bmatrix}$$

with 170 fixed points

$$g_2 = \begin{bmatrix} 1 & 0 & 0 & 6 & 10 \\ 0 & 10 & 0 & 0 & 0 \\ 0 & 0 & 10 & 0 & 0 \\ 5 & 0 & 0 & 11 & 6 \\ 3 & 0 & 0 & 11 & 11 \end{bmatrix}$$

with 170 fixed points

$$g_3 = \begin{bmatrix} 6 & 0 & 0 & 12 & 7 \\ 0 & 9 & 0 & 0 & 0 \\ 0 & 7 & 9 & 2 & 1 \\ 10 & 1 & 0 & 12 & 9 \\ 6 & 2 & 0 & 10 & 12 \end{bmatrix}$$

with 16 fixed points

$$g_4 = \begin{bmatrix} 9 & 0 & 0 & 8 & 9 \\ 0 & 6 & 10 & 7 & 10 \\ 0 & 4 & 6 & 11 & 12 \\ 2 & 12 & 10 & 2 & 3 \\ 9 & 11 & 7 & 12 & 2 \end{bmatrix}$$

with 2 fixed points

$$g_5 = \begin{bmatrix} 0 & 6 & 4 & 5 & 9 \\ 2 & 7 & 3 & 8 & 5 \\ 8 & 12 & 7 & 5 & 12 \\ 8 & 2 & 5 & 6 & 5 \\ 3 & 12 & 8 & 8 & 8 \end{bmatrix}$$

with 2 fixed points

3.3 Isomorphism Type 2

Stabilizer has order 48
Plane intersection type is $4^{24}\ 3^{268}$
Plane invariant is too big (24 planes)

$\rightarrow$	18_1	6_3
12_0	6	1
2_2	0	6

$\downarrow$	18_1	6_3
12_0	4	2
2_2	0	2

$C_0 = \{1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}_{12}$
$C_1 = \{0, 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 19, 22\}_{18}$
$C_2 = \{0, 2\}_2$
$C_3 = \{5, 15, 18, 20, 21, 23\}_6$

$\rightarrow$	18_1	6_3
12_0	6	1
2_2	0	6

$\downarrow$	18_1	6_3
12_0	4	2
2_2	0	2

$C_0 = \{1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}_{12}$
$C_1 = \{0, 1, 2, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 17, 18, 20, 23\}_{18}$
$C_2 = \{0, 2\}_2$
$C_3 = \{3, 9, 16, 19, 21, 22\}_6$
Column cell 1:
Column cell 3:
Order of the group that is induced on the object is 48
Number of ancestors on 5-sets is 62.
Number of orbits on 5-sets is 62.
With 2 orbits on the object
Orbit lengths: 2, 12
The points by ranks:

i	Rank
0	0
1	1
2	64
3	65

i	Rank
4	103
5	146
6	1258
7	1017

i	Rank
8	1738
9	1050
10	1510
11	2193

i	Rank
12	1609
13	849

The points:

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

Stabilizer of order 48 is generated by:

$$g_1 = \begin{bmatrix} 4 & 0 & 0 & 11 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 7 & 0 & 0 & 5 & 11 \\ 12 & 0 & 0 & 5 & 5 \end{bmatrix}$$

with 170 fixed points

$$g_2 = \begin{bmatrix} 9 & 0 & 0 & 0 & 0 \\ 0 & 4 & 0 & 0 & 0 \\ 0 & 7 & 4 & 3 & 8 \\ 0 & 8 & 0 & 9 & 0 \\ 0 & 3 & 0 & 0 & 9 \end{bmatrix}$$

with 16 fixed points

$$g_3 = \begin{bmatrix} 12 & 0 & 0 & 0 & 0 \\ 0 & 12 & 0 & 0 & 0 \\ 0 & 2 & 12 & 6 & 9 \\ 0 & 9 & 0 & 0 & 8 \\ 0 & 6 & 0 & 5 & 0 \end{bmatrix}$$

with 170 fixed points

$$g_4 = \begin{bmatrix} 9 & 8 & 0 & 8 & 5 \\ 0 & 10 & 0 & 0 & 0 \\ 4 & 2 & 3 & 7 & 8 \\ 9 & 2 & 0 & 1 & 10 \\ 4 & 8 & 0 & 10 & 1 \end{bmatrix}$$

with 2 fixed points

$$g_5 = \begin{bmatrix} 6 & 0 & 0 & 0 & 0 \\ 0 & 6 & 10 & 7 & 10 \\ 0 & 0 & 6 & 0 & 0 \\ 0 & 0 & 10 & 0 & 10 \\ 0 & 0 & 7 & 1 & 0 \end{bmatrix}$$

with 170 fixed points

Chapter 4

The BLT-Sets in Numeric Form

0, 1, 64, 65, 66, 70, 72, 67, 68, 69, 71, 73, 74, 75
0, 1, 64, 65, 66, 70, 72, 1076, 1604, 1398, 1773, 1641, 2190, 1130
0, 1, 64, 65, 103, 146, 1258, 1017, 1738, 1050, 1510, 2193, 1609, 849

```
INT BLT_13_size = 14;
INT BLT_13_nb_reps = 3;
INT BLT_13_reps[] = {
0, 1, 64, 65, 66, 70, 72, 67, 68, 69, 71, 73, 74, 75,
0, 1, 64, 65, 66, 70, 72, 1076, 1604, 1398, 1773, 1641, 2190, 1130,
0, 1, 64, 65, 103, 146, 1258, 1017, 1738, 1050, 1510, 2193, 1609, 849,
};
const BYTE *BLT_13_stab_order[] = {
"61152",
"392",
"48",
};
INT BLT_13_stab_gens[] = {
 7,  0,  0,  0,  0,  0,  6,  0,  0,  0,  0,  0,  6,  0,  0,  0,  0,  0,  6,  0,  0,  0,  0,  0,  6,
 1,  0,  0,  0,  0,  0,  6,  0,  0,  0,  0,  0, 11,  0,  0,  0,  0,  0, 12,  0,  0,  0,  0,  0, 12,
 9,  0,  0, 12,  7,  0, 10,  0,  0,  0,  0,  0, 10,  0,  0, 10,  0,  0,  7,  8,  6,  0,  0,  6,  7,
 1,  0,  0,  3,  5,  0,  4,  0,  0,  0,  0,  0,  4,  0,  0,  4,  0,  0,  9,  4,  5,  0,  0,  3,  9,
 3,  0,  0,  7,  3,  0,  2,  0,  0,  0,  0,  3,  2, 12,  6,  5,  6,  0,  7,  2,  3, 12,  0,  8,  7,
11,  0,  0,  9,  2,  0, 10,  8,  3,  8,  0, 11, 10,  1,  7,  1,  7,  8, 12,  5, 11,  1,  3,  7, 12,
 9,  0,  0,  1,  6,  0, 10,  0,  0,  0,  0,  0, 10,  0,  0,  3,  0,  0,  7,  8,  7,  0,  0,  6,  7,
 1,  0,  0,  6, 10,  0, 10,  0,  0,  0,  0,  0, 10,  0,  0,  5,  0,  0, 11,  6,  3,  0,  0, 11, 11,
 6,  0,  0, 12,  7,  0,  9,  0,  0,  0,  0,  7,  9,  2,  1, 10,  1,  0, 12,  9,  6,  2,  0, 10, 12,
 9,  0,  0,  8,  9,  0,  6, 10,  7, 10,  0,  4,  6, 11, 12,  2, 12, 10,  2,  3,  9, 11,  7, 12,  2,
 0,  6,  4,  5,  9,  2,  7,  3,  8,  5,  8, 12,  7,  5, 12,  8,  2,  5,  6,  5,  3, 12,  8,  8,  8,
 4,  0,  0, 11,  1,  0,  1,  0,  0,  0,  0,  0,  1,  0,  0,  7,  0,  0,  5, 11, 12,  0,  0,  5,  5,
 9,  0,  0,  0,  0,  0,  4,  0,  0,  0,  0,  7,  4,  3,  8,  0,  8,  0,  9,  0,  0,  3,  0,  0,  9,
12,  0,  0,  0,  0,  0, 12,  0,  0,  0,  0,  2, 12,  6,  9,  0,  9,  0,  0,  8,  0,  6,  0,  5,  0,
 9,  8,  0,  8,  5,  0, 10,  0,  0,  0,  4,  2,  3,  7,  8,  9,  2,  0,  1, 10,  4,  8,  0, 10,  1,
 6,  0,  0,  0,  0,  0,  6, 10,  7, 10,  0,  0,  6,  0,  0,  0,  0, 10,  0, 10,  0,  0,  7,  1,  0,
};
INT BLT_13_stab_gens_fst[] = { 0, 6, 11};
INT BLT_13_stab_gens_len[] = { 6, 5, 5};
INT BLT_13_make_element_size = 0;
```