

# BLT-sets of $Q(4, 19)$

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# Chapter 1

## Summary

There are 5 BLT-sets.



# Chapter 2

## Invariants



## Chapter 3

### The BLT-Sets

### 3.1 Isomorphism Type 0

Stabilizer has order 273600

Plane intersection type is 20

Plane invariant is

$$\begin{array}{c} [20] \\ \xrightarrow{\quad} \begin{array}{c|c} & 1_1 \\ \hline 20_0 & 1 \end{array} \quad \begin{array}{c|c} \downarrow & 1_1 \\ \hline 20_0 & 20 \end{array} \end{array}$$

$$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19\}_{20}$$

$$C_1 = \{0\}_1$$

$$\begin{array}{c} \xrightarrow{\quad} \begin{array}{c|c} & 1_1 \\ \hline 20_0 & 1 \end{array} \\ \downarrow \begin{array}{c|c} & 1_1 \\ \hline 20_0 & 20 \end{array} \end{array}$$

$$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19\}_{20}$$

$$C_1 = \{0\}_1$$

Column cell 1:

Order of the group that is induced on the object is 6840

Number of ancestors on 5-sets is 5.

Number of orbits on 5-sets is 5.

With 1 orbits on the object

Orbit lengths: 20

The points by ranks:

$i$	Rank	$i$	Rank	$i$	Rank	$i$	Rank
0	0	5	97	10	100	15	106
1	1	6	98	11	101	16	108
2	94	7	99	12	102	17	109
3	95	8	104	13	103	18	110
4	96	9	107	14	105	19	111

The points:

$$P_0 = (0, 1, 0, 0, 0) P_1 = (0, 0, 1, 0, 0) P_2 = (0, 1, 9, 18, 9) P_3 = (0, 1, 7, 9, 14)$$

$$P_4 = (0, 1, 1, 6, 3) P_5 = (0, 1, 16, 14, 7) P_6 = (0, 1, 11, 15, 17) P_7 = (0, 1, 5, 3, 11)$$

$$P_8 = (0, 1, 4, 12, 6) P_9 = (0, 1, 11, 4, 2) P_{10} = (0, 1, 6, 8, 4) P_{11} = (0, 1, 4, 7, 13)$$

$$P_{12} = (0, 1, 17, 2, 1) P_{13} = (0, 1, 17, 17, 18) P_{14} = (0, 1, 6, 11, 15) P_{15} = (0, 1, 5, 16, 8)$$

$$P_{16} = (0, 1, 16, 5, 12) P_{17} = (0, 1, 1, 13, 16) P_{18} = (0, 1, 7, 10, 5) P_{19} = (0, 1, 9, 1, 10)$$

Stabilizer of order 273600 is generated by:

$$g_1 = \begin{pmatrix} 18 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

with 400 fixed points

$$g_2 = \begin{pmatrix} 6 & 0 & 0 & 0 & 0 \\ 0 & 12 & 0 & 0 & 0 \\ 0 & 0 & 3 & 0 & 0 \\ 0 & 0 & 0 & 13 & 0 \\ 0 & 0 & 0 & 0 & 13 \end{pmatrix}$$

with 4 fixed points

$$g_3 = \begin{pmatrix} 16 & 0 & 0 & 0 & 0 \\ 0 & 4 & 0 & 0 & 0 \\ 0 & 0 & 7 & 0 & 0 \\ 0 & 0 & 0 & 3 & 0 \\ 0 & 0 & 0 & 0 & 3 \end{pmatrix}$$

with 4 fixed points

$$g_4 = \begin{pmatrix} 3 & 0 & 0 & 17 & 1 \\ 0 & 11 & 0 & 0 & 0 \\ 0 & 0 & 11 & 0 & 0 \\ 10 & 0 & 0 & 4 & 13 \\ 18 & 0 & 0 & 14 & 4 \end{pmatrix}$$

with 400 fixed points

$$g_5 = \begin{pmatrix} 14 & 0 & 0 & 15 & 2 \\ 0 & 6 & 0 & 0 & 0 \\ 0 & 0 & 6 & 0 & 0 \\ 1 & 0 & 0 & 15 & 5 \\ 17 & 0 & 0 & 1 & 15 \end{pmatrix}$$

with 362 fixed points

$$g_6 = \begin{pmatrix} 14 & 0 & 0 & 3 & 8 \\ 0 & 12 & 0 & 0 & 0 \\ 0 & 12 & 12 & 15 & 17 \\ 4 & 17 & 0 & 6 & 10 \\ 11 & 15 & 0 & 2 & 6 \end{pmatrix}$$

with 22 fixed points

$$g_7 = \begin{pmatrix} 17 & 0 & 0 & 0 & 0 \\ 0 & 15 & 0 & 0 & 0 \\ 0 & 13 & 18 & 11 & 15 \\ 0 & 11 & 0 & 2 & 0 \\ 0 & 3 & 0 & 0 & 2 \end{pmatrix}$$

with 4 fixed points

$$g_8 = \begin{pmatrix} 0 & 0 & 0 & 15 & 2 \\ 0 & 5 & 16 & 7 & 13 \\ 0 & 9 & 5 & 10 & 5 \\ 1 & 5 & 13 & 1 & 10 \\ 17 & 10 & 7 & 2 & 1 \end{pmatrix}$$

with 22 fixed points

## 3.2 Isomorphism Type 1

Stabilizer has order 800

Plane intersection type is  $10^2 4^{25} 3^{800}$

Plane invariant is

$$\begin{array}{c} \left[ \begin{array}{cc} 10 & 0 \\ 0 & 10 \end{array} \right] \\ \xrightarrow{\quad} \left| \begin{array}{cc} 2_1 & \\ 1 & \end{array} \right| \quad \left| \begin{array}{cc} 2_1 \\ 20_0 & 10 \end{array} \right| \\ \hline \end{array}$$

$$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19\}_{20}$$

$$C_1 = \{0, 1\}_2$$

$$\begin{array}{c} \xrightarrow{\quad} \left| \begin{array}{cc} 2_1 & 25_2 \\ 1 & 5 \end{array} \right| \\ \hline \left| \begin{array}{cc} \downarrow & \\ 20_0 & 10 & 4 \end{array} \right| \end{array}$$

$$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19\}_{20}$$

$$C_1 = \{0, 26\}_2$$

$$C_2 = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25\}_{25}$$

Column cell 1:

Column cell 2:

Order of the group that is induced on the object is 800

Number of ancestors on 5-sets is 149.

Number of orbits on 5-sets is 72.

With 1 orbits on the object

Orbit lengths: 20

The points by ranks:

$i$	Rank	$i$	Rank	$i$	Rank	$i$	Rank
0	0	5	97	10	3533	15	5105
1	1	6	98	11	3860	16	7008
2	94	7	99	12	4860	17	6991
3	95	8	104	13	3349	18	6623
4	96	9	107	14	3884	19	2630

The points:

$$P_0 = (0, 1, 0, 0, 0) P_1 = (0, 0, 1, 0, 0) P_2 = (0, 1, 9, 18, 9) P_3 = (0, 1, 7, 9, 14)$$

$$P_4 = (0, 1, 1, 6, 3) P_5 = (0, 1, 16, 14, 7) P_6 = (0, 1, 11, 15, 17) P_7 = (0, 1, 5, 3, 11)$$

$$P_8 = (0, 1, 4, 12, 6) P_9 = (0, 1, 11, 4, 2) P_{10} = (1, 13, 10, 12, 16) P_{11} = (1, 9, 4, 7, 11)$$

$$P_{12} = (1, 3, 14, 2, 7) P_{13} = (1, 4, 6, 2, 16) P_{14} = (1, 11, 7, 3, 12) P_{15} = (1, 8, 12, 14, 8)$$

$$P_{16} = (1, 15, 13, 6, 18) P_{17} = (1, 16, 5, 5, 18) P_{18} = (1, 10, 15, 16, 6) P_{19} = (1, 6, 9, 6, 13)$$

Stabilizer of order 800 is generated by:

$$g_1 = \begin{pmatrix} 18 & 0 & 0 & 11 & 4 \\ 0 & 11 & 0 & 0 & 0 \\ 0 & 0 & 11 & 0 & 0 \\ 17 & 0 & 0 & 5 & 3 \\ 4 & 0 & 0 & 12 & 5 \end{pmatrix}$$

with 20 fixed points

$$g_2 = \begin{pmatrix} 14 & 0 & 0 & 15 & 2 \\ 0 & 6 & 0 & 0 & 0 \\ 0 & 0 & 6 & 0 & 0 \\ 1 & 0 & 0 & 15 & 5 \\ 17 & 0 & 0 & 1 & 15 \end{pmatrix}$$

with 362 fixed points

$$g_3 = \begin{pmatrix} 7 & 0 & 0 & 2 & 18 \\ 0 & 16 & 0 & 0 & 0 \\ 0 & 7 & 16 & 2 & 1 \\ 9 & 1 & 0 & 17 & 12 \\ 1 & 2 & 0 & 10 & 17 \end{pmatrix}$$

with 20 fixed points

$$g_4 = \begin{pmatrix} 7 & 0 & 0 & 2 & 18 \\ 0 & 16 & 11 & 3 & 11 \\ 0 & 0 & 16 & 0 & 0 \\ 9 & 0 & 11 & 17 & 12 \\ 1 & 0 & 3 & 10 & 17 \end{pmatrix}$$

with 20 fixed points

$$g_5 = \begin{pmatrix} 11 & 0 & 0 & 14 & 12 \\ 0 & 0 & 16 & 0 & 0 \\ 0 & 5 & 7 & 14 & 7 \\ 6 & 0 & 1 & 5 & 8 \\ 7 & 0 & 2 & 13 & 5 \end{pmatrix}$$

with 2 fixed points

$$g_6 = \begin{pmatrix} 0 & 0 & 0 & 4 & 17 \\ 0 & 14 & 3 & 12 & 6 \\ 0 & 14 & 14 & 8 & 4 \\ 18 & 4 & 6 & 11 & 15 \\ 2 & 8 & 12 & 3 & 11 \end{pmatrix}$$

with 20 fixed points

$$g_7 = \begin{pmatrix} 0 & 13 & 15 & 12 & 6 \\ 5 & 1 & 11 & 10 & 4 \\ 2 & 7 & 1 & 5 & 13 \\ 8 & 9 & 16 & 1 & 1 \\ 16 & 13 & 5 & 9 & 15 \end{pmatrix}$$

with 0 fixed points

### 3.3 Isomorphism Type 2

Stabilizer has order 16

Plane intersection type is  $5^4 4^{53} 3^{888}$

Plane invariant is

$$\begin{array}{c} \left[ \begin{array}{cccc} 5 & 2 & 1 & 2 \\ 2 & 5 & 2 & 1 \\ 1 & 2 & 5 & 2 \\ 2 & 1 & 2 & 5 \end{array} \right] \\ \hline \begin{array}{c|c} \rightarrow & 4_1 \\ \hline 10_0 & 2 \\ 10_2 & 0 \end{array} \quad \begin{array}{c|c} \downarrow & 4_1 \\ \hline 10_0 & 5 \\ 10_2 & 0 \end{array} \end{array}$$

$$C_0 = \{0, 1, 2, 3, 4, 5, 7, 8, 9, 10\}_{10}$$

$$C_1 = \{0, 1, 2, 3\}_4$$

$$C_2 = \{6, 11, 12, 13, 14, 15, 16, 17, 18, 19\}_{10}$$

$\rightarrow$	$4_1$	$4_2$	$4_7$	$1_8$	$4_6$	$6_9$	$24_{10}$	$6_{11}$	$4_{12}$
$2_0$	2	4	4	1	2	0	0	0	0
$8_4$	2	1	0	0	0	3	6	0	0
$8_3$	0	0	1	0	1	0	6	3	1
$2_5$	0	0	0	1	2	0	0	0	4
$\downarrow$	$4_1$	$4_2$	$4_7$	$1_8$	$4_6$	$6_9$	$24_{10}$	$6_{11}$	$4_{12}$
$2_0$	1	2	2	2	1	0	0	0	0
$8_4$	4	2	0	0	0	4	2	0	0
$8_3$	0	0	2	0	2	0	2	4	2
$2_5$	0	0	0	2	1	0	0	0	2

$$C_0 = \{0, 5\}_2$$

$$C_1 = \{17, 42, 52, 56\}_4$$

$$C_2 = \{3, 15, 32, 47\}_4$$

$$C_3 = \{6, 12, 13, 14, 15, 16, 17, 19\}_8$$

$$C_4 = \{1, 2, 3, 4, 7, 8, 9, 10\}_8$$

$$C_5 = \{11, 18\}_2$$

$$C_6 = \{2, 11, 12, 36\}_4$$

$$C_7 = \{6, 18, 28, 46\}_4$$

$$C_8 = \{19\}_1$$

$$C_9 = \{4, 16, 33, 34, 43, 53\}_6$$

$$C_{10} = \{0, 1, 5, 8, 9, 10, 13, 14, 29, 30, 31, 35, 38, 39, 40, 41, 44, 45, 48, 49, 50, 51, 54, 55\}_{24}$$

$$C_{11} = \{7, 20, 21, 25, 26, 27\}_6$$

$$C_{12} = \{22, 23, 24, 37\}_4$$

Column cell 1:

Column cell 2:

Column cell 6:

Column cell 7:

Column cell 8:

Column cell 9:

Column cell 10:

Column cell 11:

Column cell 12:

Order of the group that is induced on the object is 16

Number of ancestors on 5-sets is 1125.

Number of orbits on 5-sets is 1125.

With 4 orbits on the object

Orbit lengths:  $2^2, 8^2$

The points by ranks:

$i$	Rank	$i$	Rank	$i$	Rank	$i$	Rank
0	0	5	1811	10	6085	15	6753
1	1	6	4795	11	6818	16	5115
2	94	7	1819	12	1857	17	1802
3	95	8	4609	13	5078	18	2312
4	96	9	5293	14	3350	19	7125

The points:

$$P_0 = (0, 1, 0, 0, 0) P_1 = (0, 0, 1, 0, 0) P_2 = (0, 1, 9, 18, 9) P_3 = (0, 1, 7, 9, 14)$$

$$P_4 = (0, 1, 1, 6, 3) P_5 = (1, 2, 12, 13, 1) P_6 = (1, 4, 5, 16, 7) P_7 = (1, 4, 6, 13, 1)$$

$$P_8 = (1, 17, 6, 15, 2) P_9 = (1, 5, 6, 8, 8) P_{10} = (1, 7, 6, 1, 14) P_{11} = (1, 7, 7, 5, 9)$$

$$P_{12} = (1, 12, 18, 11, 1) P_{13} = (1, 6, 9, 3, 7) P_{14} = (1, 9, 9, 2, 16) P_{15} = (1, 12, 18, 16, 9)$$

$$P_{16} = (1, 18, 18, 14, 8) P_{17} = (1, 11, 9, 14, 1) P_{18} = (1, 4, 4, 4, 10) P_{19} = (1, 18, 8, 12, 18)$$

Stabilizer of order 16 is generated by:

$$g_1 = \begin{pmatrix} 14 & 0 & 0 & 15 & 2 \\ 0 & 6 & 0 & 0 & 0 \\ 0 & 0 & 6 & 0 & 0 \\ 1 & 0 & 0 & 15 & 5 \\ 17 & 0 & 0 & 1 & 15 \end{pmatrix}$$

with 362 fixed points

$$g_2 = \begin{pmatrix} 7 & 0 & 0 & 17 & 1 \\ 0 & 3 & 0 & 0 & 0 \\ 0 & 3 & 3 & 18 & 9 \\ 10 & 9 & 0 & 14 & 1 \\ 18 & 18 & 0 & 4 & 14 \end{pmatrix}$$

with 20 fixed points

$$g_3 = \begin{pmatrix} 17 & 3 & 0 & 6 & 16 \\ 0 & 9 & 0 & 0 & 0 \\ 11 & 6 & 9 & 10 & 11 \\ 8 & 11 & 0 & 6 & 2 \\ 3 & 10 & 0 & 8 & 6 \end{pmatrix}$$

with 20 fixed points

$$g_4 = \begin{pmatrix} 1 & 15 & 7 & 12 & 3 \\ 13 & 7 & 4 & 17 & 13 \\ 0 & 5 & 7 & 14 & 7 \\ 17 & 10 & 13 & 5 & 15 \\ 18 & 17 & 17 & 6 & 15 \end{pmatrix}$$

with 2 fixed points

### 3.4 Isomorphism Type 3

Stabilizer has order 40

Plane intersection type is  $5^4 4^{20} 3^{1020}$

Plane invariant is

$$\begin{array}{c} \left[ \begin{array}{cccc} 5 & 0 & 0 & 0 \\ 0 & 5 & 0 & 0 \\ 0 & 0 & 5 & 0 \\ 0 & 0 & 0 & 5 \end{array} \right] \\ \xrightarrow{\quad} \begin{array}{c|cc} & 4_1 & \\ \hline 20_0 & 1 & \end{array} \quad \begin{array}{c|cc} & 4_1 & \\ \hline 20_0 & 5 & \end{array} \end{array}$$

$$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19\}_{20}$$

$$C_1 = \{0, 1, 2, 3\}_4$$

$$\begin{array}{c} \xrightarrow{\quad} \begin{array}{c|cc} & 4_1 & 20_2 \\ \hline 20_0 & 1 & 4 \end{array} \\ \xrightarrow{\quad} \begin{array}{c|cc} & 4_1 & 20_2 \\ \hline 20_0 & 5 & 4 \end{array} \end{array}$$

$$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19\}_{20}$$

$$C_1 = \{2, 3, 11, 18\}_4$$

$$C_2 = \{0, 1, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23\}_{20}$$

Column cell 1:

Column cell 2:

Order of the group that is induced on the object is 40

Number of ancestors on 5-sets is 406.

Number of orbits on 5-sets is 406.

With 1 orbits on the object

Orbit lengths: 20

The points by ranks:

$i$	Rank	$i$	Rank	$i$	Rank	$i$	Rank
0	0	5	333	10	6017	15	2356
1	1	6	3049	11	5711	16	4337
2	94	7	2715	12	6014	17	2934
3	95	8	2504	13	2192	18	3972
4	116	9	3660	14	4304	19	3025

The points:

$$P_0 = (0, 1, 0, 0, 0)P_1 = (0, 0, 1, 0, 0)P_2 = (0, 1, 9, 18, 9)P_3 = (0, 1, 7, 9, 14)$$

$$P_4 = (0, 1, 1, 15, 5)P_5 = (0, 1, 7, 3, 4)P_6 = (1, 5, 5, 3, 4)P_7 = (1, 10, 8, 18, 5)$$

$$P_8 = (1, 1, 9, 8, 13)P_9 = (1, 18, 13, 8, 11)P_{10} = (1, 2, 10, 8, 14)P_{11} = (1, 2, 10, 10, 15)$$

$$P_{12} = (1, 4, 9, 14, 15)P_{13} = (1, 4, 7, 18, 10)P_{14} = (1, 5, 9, 4, 17)P_{15} = (1, 13, 3, 13, 13)$$

$$P_{16} = (1, 12, 15, 5, 17)P_{17} = (1, 12, 14, 8, 5)P_{18} = (1, 16, 17, 1, 12)P_{19} = (1, 7, 6, 13, 4)$$

Stabilizer of order 40 is generated by:

$$g_1 = \begin{pmatrix} 16 & 6 & 0 & 18 & 17 \\ 0 & 7 & 0 & 0 & 0 \\ 3 & 17 & 7 & 15 & 13 \\ 18 & 13 & 0 & 17 & 10 \\ 9 & 15 & 0 & 12 & 17 \end{pmatrix}$$

with 20 fixed points

$$g_2 = \begin{pmatrix} 6 & 0 & 0 & 1 & 9 \\ 0 & 0 & 17 & 0 & 0 \\ 0 & 6 & 0 & 0 & 0 \\ 14 & 0 & 0 & 1 & 13 \\ 10 & 0 & 0 & 14 & 1 \end{pmatrix}$$

with 22 fixed points

$$g_3 = \begin{pmatrix} 10 & 0 & 17 & 10 & 12 \\ 18 & 9 & 11 & 1 & 14 \\ 0 & 1 & 9 & 18 & 9 \\ 6 & 9 & 14 & 18 & 10 \\ 5 & 18 & 1 & 5 & 18 \end{pmatrix}$$

with 20 fixed points

### 3.5 Isomorphism Type 4

Stabilizer has order 20

Plane intersection type is  $4^{50} 3^{940}$

Plane invariant is too big (50 planes)

$$\begin{array}{c|cc} \rightarrow & 50_1 \\ \hline 20_0 & 10 \end{array} \quad \begin{array}{c|cc} \downarrow & 50_1 \\ \hline 20_0 & 4 \end{array}$$

$$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19\}_{20}$$

$$C_1 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50\}_{20}$$

$$\begin{array}{c|cc} \rightarrow & 50_1 \\ \hline 20_0 & 10 \end{array} \quad \begin{array}{c|cc} \downarrow & 50_1 \\ \hline 20_0 & 4 \end{array}$$

$$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19\}_{20}$$

$$C_1 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50\}_{20}$$

Column cell 1:

Order of the group that is induced on the object is 20

Number of ancestors on 5-sets is 825.

Number of orbits on 5-sets is 776.

With 1 orbits on the object

Orbit lengths: 20

The points by ranks:

$i$	Rank	$i$	Rank	$i$	Rank	$i$	Rank
0	0	5	3010	10	6140	15	7233
1	1	6	4764	11	3977	16	383
2	94	7	207	12	5399	17	7012
3	96	8	3678	13	2618	18	5074
4	116	9	4363	14	3582	19	120

The points:

$$P_0 = (0, 1, 0, 0, 0) P_1 = (0, 0, 1, 0, 0) P_2 = (0, 1, 9, 18, 9) P_3 = (0, 1, 1, 6, 3)$$

$$P_4 = (0, 1, 1, 15, 5) P_5 = (1, 4, 1, 13, 4) P_6 = (1, 11, 17, 1, 2) P_7 = (0, 1, 6, 3, 17)$$

$$P_8 = (1, 2, 13, 1, 11) P_9 = (1, 6, 5, 6, 17) P_{10} = (1, 5, 9, 13, 14) P_{11} = (1, 8, 15, 1, 12)$$

$$P_{12} = (1, 10, 15, 12, 8) P_{13} = (1, 4, 4, 6, 13) P_{14} = (1, 15, 14, 5, 11) P_{15} = (1, 14, 8, 18, 18)$$

$$P_{16} = (0, 1, 5, 9, 10) P_{17} = (1, 16, 11, 6, 18) P_{18} = (1, 18, 3, 3, 7) P_{19} = (0, 1, 5, 2, 7)$$

Stabilizer of order 20 is generated by:

$$g_1 = \begin{pmatrix} 15 & 0 & 0 & 0 & 0 \\ 0 & 0 & 4 & 0 & 0 \\ 0 & 4 & 4 & 5 & 12 \\ 0 & 0 & 1 & 6 & 0 \\ 0 & 0 & 3 & 0 & 9 \end{pmatrix}$$

with 0 fixed points

$$g_2 = \begin{pmatrix} 6 & 8 & 18 & 7 & 1 \\ 0 & 3 & 8 & 16 & 8 \\ 10 & 2 & 10 & 16 & 2 \\ 17 & 13 & 6 & 3 & 17 \\ 12 & 10 & 8 & 4 & 1 \end{pmatrix}$$

with 0 fixed points



# Chapter 4

## The BLT-Sets in Numeric Form

```
0, 1, 94, 95, 96, 97, 98, 99, 104, 107, 100, 101, 102, 103, 105, 106, 108, 109, 110, 111
0, 1, 94, 95, 96, 97, 98, 99, 104, 107, 3533, 3860, 4860, 3349, 3884, 5105, 7008, 6991, 6623, 2630
0, 1, 94, 95, 96, 1811, 4795, 1819, 4609, 5293, 6085, 6818, 1857, 5078, 3350, 6753, 5115, 1802, 2312, 7125
0, 1, 94, 95, 116, 333, 3049, 2715, 2504, 3660, 6017, 5711, 6014, 2192, 4304, 2356, 4337, 2934, 3972, 3025
0, 1, 94, 96, 116, 3010, 4764, 207, 3678, 4363, 6140, 3977, 5399, 2618, 3582, 7233, 383, 7012, 5074, 120
```

```
INT BLT_19_size = 20;
INT BLT_19_nb_reps = 5;
INT BLT_19_reps[] = {
0, 1, 94, 95, 96, 97, 98, 99, 104, 107, 100, 101, 102, 103, 105, 106, 108, 109, 110, 111,
0, 1, 94, 95, 96, 97, 98, 99, 104, 107, 3533, 3860, 4860, 3349, 3884, 5105, 7008, 6991, 6623, 2630,
0, 1, 94, 95, 96, 1811, 4795, 1819, 4609, 5293, 6085, 6818, 1857, 5078, 3350, 6753, 5115, 1802, 2312, 7125,
0, 1, 94, 95, 116, 333, 3049, 2715, 2504, 3660, 6017, 5711, 6014, 2192, 4304, 2356, 4337, 2934, 3972, 3025,
0, 1, 94, 96, 116, 3010, 4764, 207, 3678, 4363, 6140, 3977, 5399, 2618, 3582, 7233, 383, 7012, 5074, 120,
};

const BYTE *BLT_19_stab_order[] = {
"273600",
"800",
"16",
"40",
"20",
};

INT BLT_19_stab_gens[] = {
18, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1,
6, 0, 0, 0, 0, 0, 12, 0, 0, 0, 0, 0, 3, 0, 0, 0, 0, 0, 0, 13, 0, 0, 0, 0, 0, 0, 0, 0, 0, 13,
16, 0, 0, 0, 0, 0, 4, 0, 0, 0, 0, 0, 7, 0, 0, 0, 0, 0, 0, 3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 3,
3, 0, 0, 17, 1, 0, 11, 0, 0, 0, 0, 0, 11, 0, 0, 10, 0, 0, 0, 4, 13, 18, 0, 0, 14, 4,
14, 0, 0, 15, 2, 0, 6, 0, 0, 0, 0, 0, 6, 0, 0, 1, 0, 0, 15, 5, 17, 0, 0, 1, 15,
14, 0, 0, 3, 8, 0, 12, 0, 0, 0, 0, 12, 12, 15, 17, 4, 17, 0, 6, 10, 11, 15, 0, 2, 6,
17, 0, 0, 0, 0, 15, 0, 0, 0, 13, 18, 11, 15, 0, 11, 0, 2, 0, 0, 3, 0, 0, 2,
0, 0, 0, 15, 2, 0, 5, 16, 7, 13, 0, 9, 5, 10, 5, 1, 5, 13, 1, 10, 17, 10, 7, 2, 1,
18, 0, 0, 11, 4, 0, 11, 0, 0, 0, 0, 11, 0, 0, 17, 0, 0, 5, 3, 4, 0, 0, 12, 5,
14, 0, 0, 15, 2, 0, 6, 0, 0, 0, 0, 6, 0, 0, 1, 0, 0, 15, 5, 17, 0, 0, 1, 15,
7, 0, 0, 2, 18, 0, 16, 0, 0, 0, 0, 7, 16, 2, 1, 9, 1, 0, 17, 12, 1, 2, 0, 10, 17,
7, 0, 0, 2, 18, 0, 16, 11, 3, 11, 0, 0, 16, 0, 0, 9, 0, 11, 17, 12, 1, 0, 3, 10, 17,
11, 0, 0, 14, 12, 0, 0, 16, 0, 0, 0, 5, 7, 14, 7, 6, 0, 1, 5, 8, 7, 0, 2, 13, 5,
0, 0, 0, 4, 17, 0, 14, 3, 12, 6, 0, 14, 14, 8, 4, 18, 4, 6, 11, 15, 2, 8, 12, 3, 11,
0, 13, 15, 12, 6, 5, 1, 11, 10, 4, 2, 7, 1, 5, 13, 8, 9, 16, 1, 1, 16, 13, 5, 9, 15,
14, 0, 0, 15, 2, 0, 6, 0, 0, 0, 0, 6, 0, 0, 1, 0, 0, 15, 5, 17, 0, 0, 1, 15,
7, 0, 0, 17, 1, 0, 3, 0, 0, 0, 0, 3, 3, 18, 9, 10, 9, 0, 14, 1, 18, 18, 0, 4, 14,
17, 3, 0, 6, 16, 0, 9, 0, 0, 0, 11, 6, 9, 10, 11, 8, 11, 0, 6, 2, 3, 10, 0, 8, 6,
1, 15, 7, 12, 3, 13, 7, 4, 17, 13, 0, 5, 7, 14, 7, 17, 10, 13, 5, 15, 18, 17, 17, 6, 15,
16, 6, 0, 18, 17, 0, 7, 0, 0, 0, 3, 17, 7, 15, 13, 18, 13, 0, 17, 10, 9, 15, 0, 12, 17,
```

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6, 0, 0, 1, 9, 0, 0, 17, 0, 0, 0, 6, 0, 0, 0, 14, 0, 0, 1, 13, 10, 0, 0, 14, 1,
10, 0, 17, 10, 12, 18, 9, 11, 1, 14, 0, 1, 9, 18, 9, 6, 9, 14, 18, 10, 5, 18, 1, 5, 18,
15, 0, 0, 0, 0, 4, 0, 0, 0, 4, 4, 5, 12, 0, 0, 1, 6, 0, 0, 0, 3, 0, 9,
6, 8, 18, 7, 1, 0, 3, 8, 16, 8, 10, 2, 10, 16, 2, 17, 13, 6, 3, 17, 12, 10, 8, 4, 1,
};

INT BLT_19_stab_gens_fst[] = { 0, 8, 15, 19, 22};
INT BLT_19_stab_gens_len[] = { 8, 7, 4, 3, 2};
INT BLT_19_make_element_size = 0;
```