

Number of vertices  $n = 10$ .

Adjacencies of Graph

1. vertex 1 adjacent to 2 5 6 10
2. vertex 2 adjacent to 1 3 6 7
3. vertex 3 adjacent to 2 4 7 8
4. vertex 4 adjacent to 3 5 8 9
5. vertex 5 adjacent to 1 4 9 10
6. vertex 6 adjacent to 1 2 7 10
7. vertex 7 adjacent to 2 3 6 8
8. vertex 8 adjacent to 3 4 7 9
9. vertex 9 adjacent to 4 5 8 10
10. vertex 10 adjacent to 1 5 6 9

Size of automorphism group of the graph=20

Full group:  $|Aut(polytope)| = 10240$

Restricted group:  $|Aut(G) \times switch| = 10240$

Number of orbits for the full group : 4

List of orbits of facets for the full group: Total number of orbits = 4 Total number of facets = 552

1. Inequality 1 with incidence 384 and stabilizer of size 256. Orbit size is 40 nature: 3-cycle inequality,  $C=[ 5, 10, 1 ]$   $F=[ 5, 10 ]$

(1,2) : 0	(1,5) : 1	(1,6) : 0	(1,10) : 1	(2,3) : 0	(2,6) : 0
(2,7) : 0	(3,4) : 0	(3,7) : 0	(3,8) : 0	(4,5) : 0	(4,8) : 0
(4,9) : 0	(5,9) : 0	(5,10) : -1	(6,7) : 0	(6,10) : 0	(7,8) : 0
(8,9) : 0	(9,10) : 0				

2. Inequality 2 with incidence 160 and stabilizer of size 320. Orbit size is 32 nature: 5-cycle inequality,  $C=[ 4, 5, 1, 2, 3 ]$   $F=[ 4, 5 ]$

(1,2) : 1	(1,5) : 1	(1,6) : 0	(1,10) : 0	(2,3) : 1	(2,6) : 0
(2,7) : 0	(3,4) : 1	(3,7) : 0	(3,8) : 0	(4,5) : -1	(4,8) : 0
(4,9) : 0	(5,9) : 0	(5,10) : 0	(6,7) : 0	(6,10) : 0	(7,8) : 0
(8,9) : 0	(9,10) : 0				

3. Inequality 3 with incidence 96 and stabilizer of size 32. Orbit size is 320 nature: 6-cycle inequality, C=[ 7, 8, 4, 5, 10, 6 ] F=[ 7, 8 ]

(1,2) : 0	(1,5) : 0	(1,6) : 0	(1,10) : 0	(2,3) : 0	(2,6) : 0
(2,7) : 0	(3,4) : 0	(3,7) : 0	(3,8) : 0	(4,5) : 1	(4,8) : 1
(4,9) : 0	(5,9) : 0	(5,10) : 1	(6,7) : 1	(6,10) : 1	(7,8) : -1
(8,9) : 0	(9,10) : 0				

4. Inequality 4 with incidence 96 and stabilizer of size 64. Orbit size is 160 nature: 6-cycle inequality, C=[ 4, 9, 10, 6, 2, 3 ] F=[ 4, 9 ]

(1,2) : 0	(1,5) : 0	(1,6) : 0	(1,10) : 0	(2,3) : 1	(2,6) : 1
(2,7) : 0	(3,4) : 1	(3,7) : 0	(3,8) : 0	(4,5) : 0	(4,8) : 0
(4,9) : -1	(5,9) : 0	(5,10) : 0	(6,7) : 0	(6,10) : 1	(7,8) : 0
(8,9) : 0	(9,10) : 1				