The Cone 2HMET5

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1 The intrisic informations concerning the graph of extreme rays of 2HMET5.ext

The graph considered is made of 37 elements.
The group acting on 2HMET5.ext is Group2hmet5
Under the group action we have in fact only 3 orbits to consider.
The diameter of the graph is 2.
The list of orbits is with adjacency and Size info:

E1:	0	0	0	0	0	1	0	0	1	1	27	10
E2:	0	0	0	0	1	1	0	1	1	0	22	15
E3:	0	0	1	1	0	1	1	1	0	0	20	12

The representation matrix is:

	E1	E2	E3	Adj.	Size
E1	9	12	6	27	10
E2	8	6	8	22	15
E3	5	10	5	20	12
Size	10	15	12		37

1.1 The local graphs

The complemented local graph are:
We consider graph with cardinal inferior or equal to 20
The complemented local graph for orbit 3 is:

1	3	:	11 12 14
2	9	:	6 7 8 10 11 13 14 18 20
3	9	:	4 6 7 8 10 12 13 14 19
4	9	:	3 8 9 11 12 13 14 18 20
5	5	:	7 8 10 17 18
6	9	:	2 3 7 9 11 12 16 18 20
7	9	:	2 3 5 6 11 14 15 17 18
8	9	:	2 3 4 5 11 12 14 15 19
9	3	:	4 6 14
10	5	:	2 3 5 18 20
11	9	:	1 2 4 6 7 8 16 17 18
12	9	:	1 3 4 6 8 14 15 17 18
13	3	:	2 3 4
14	9	:	1 2 3 4 7 8 9 12 16
15	3	:	7 8 12
16	5	:	6 11 14 17 20
17	5	:	5 7 11 12 16
18	9	:	2 4 5 6 7 10 11 12 19
19	3	:	3 8 18
20	5	:	2 4 6 10 16

1.2 scalar product between elements of orbits

This subsection made sense only if the representation is orthogonal which is the usual case Considering Orbit 1

1. Orbit Size is 10.
2. Norm of elements is 3.
3. Possible scalar product : 0, 1

Considering Orbit 2

1. Orbit Size is 15.
2. Norm of elements is 4.
3. Possible scalar product : 1, 2

Considering Orbit 3

1. Orbit Size is 12.
2. Norm of elements is 5.
3. Possible scalar product : 0, 2, 3

1.3 invariant group of Orbits

The invariant group of x is the set of g such that $g(x) = x$ denoted by G_x.
If x and y are in the same orbit then the groups G_x and G_y are conjuguate.
For any element x we denote O_x its Orbit, we have $|O_x| \times |G_x| = |G|$ We print only nontrivial groups Invariant group of Orbit 1:

1. Group Size is 12.
2. Elements are : (3 2 1 5 4), (3 1 2 5 4), (2 3 1 5 4), (1 3 2 5 4), (2 1 3 5 4), (1 2 3 5 4), (3 2 1 4 5), (3 1 2 4 5), (2 3 1 4 5), (1 3 2 4 5), (2 1 3 4 5), (1 2 3 4 5)

Invariant group of Orbit 2:

1. Group Size is 8.
2. Elements are : (4 3 2 1 5), (4 3 1 2 5), (3 4 2 1 5), (3 4 1 2 5), (2 1 4 3 5), (1 2 4 3 5), (2 1 3 4 5), (1 2 3 4 5)

Invariant group of Orbit 3:

1. Group Size is 10.
2. Elements are : (5 4 3 2 1), (5 3 4 1 2), (4 5 2 3 1), (3 5 1 4 2), (4 2 5 1 3), (3 1 5 2 4), (2 4 1 5 3), (1 3 2 5 4), (2 1 4 3 5), (1 2 3 4 5)

2 The intrisic informations concerning the graph of facet rays of 2HMET5.ine

The graph considered is made of 30 elements.
The group acting on 2HMET5.ine is Group2hmet5
Under the group action we have in fact only 2 orbits to consider.
The diameter of the graph is 2.
The list of orbits is with adjacency and Size info:

F1:	-1	0	1	0	1	0	0	1	0	0	25	20
F2:	0	0	0	0	0	0	0	0	0	1	21	10

The representation matrix is:

	F1	F2	Adj.	Size
F1	16	9	25	20
F2	18	3	21	10
Size	20	10		30

No complemented local graph of size inferior to 20.

2.1 scalar product between elements of orbits

This subsection made sense only if the representation is orthogonal which is the usual case Considering Orbit 1

1. Orbit Size is 20.
2. Norm of elements is 4.
3. Possible scalar product : -1, 0, 1

Considering Orbit 2

1. Orbit Size is 10.
2. Norm of elements is 1.
3. Possible scalar product : 0

2.2 invariant group of Orbits

The invariant group of x is the set of g such that $g(x) = x$ denoted by G_x.
If x and y are in the same orbit then the groups G_x and G_y are conjuguate.
For any element x we denote O_x its Orbit, we have $|O_x| \times |G_x| = |G|$ We print only nontrivial groups
Invariant group of Orbit 1:

1. Group Size is 6.
2. Elements are : (3 2 1 4 5), (3 1 2 4 5), (2 3 1 4 5), (1 3 2 4 5), (2 1 3 4 5), (1 2 3 4 5)

Invariant group of Orbit 2:

1. Group Size is 12.
2. Elements are : (2 1 5 4 3), (1 2 5 4 3), (2 1 5 3 4), (1 2 5 3 4), (2 1 4 5 3), (1 2 4 5 3), (2 1 3 5 4), (1 2 3 5 4), (2 1 4 3 5), (1 2 4 3 5), (2 1 3 4 5), (1 2 3 4 5)

3 The two incidence matrix

Incidence between Orbit of Extreme rays and Orbits of Facets

	$F1$	$F2$	Inc
$E1$	14	7	21
$E2$	12	6	18
$E3$	10	5	15

Incidence between Orbits of Facets and Orbits of Extreme Rays

	$E1$	$E2$	$E3$	Inc
$F1$	7	9	6	22
$F2$	7	9	6	22