New Graph

[4, 4, 4, 7, 7, 7, 1, 1, 1], [2, 9, 5, 8, 3, 8, 5, 6, 2]

π = [3, 2, 1, 3, 2, 1, 3, 2, 1]

POSSIBLE RANKS

1 x 18
2 x 9
3 x 6

BASE DETERMINANT 2151937075/68719476736, .3131480589e-1

NullSpace of Δ

{1, 2, 4, 5, 6, 9}, {3, 7, 8}

Nullspace of A

[{2, 5, 6, 9},{1, 4}] , [{3, 8},{7}]

1 . Coloring, {}

$\Omega p(\Delta)=0$: $p' = s^4 - 4s^6$ $p' = s^3 - 8s^6$ $p = s^2 - 32s^7$ $p' = s^2 - 16s^6$ $p' = s^5 - 2s^6$

R: [4, 4, 4, 7, 7, 7, 1, 1, 1]
B: [2, 9, 5, 8, 3, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
2 *vs* 7	2 *vs* 7	2 *vs* 7	1 *vs* 3	2 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$[y_1, 0, 0, y_1, 0, 0, y_1, 0, 0]$

$p = -s + s^3$ $p = -s + s^2$

Omega Rank for B : cycles: {{2, 9}, {3, 5}, {6, 8}} order: 2

See Matrix

$[0, y_2, y_1, 0, y_2, y_1, 0, y_2, y_1]$

$p' = s - s^3$ $p' = s^2 - s^4$ $p' = -s^3 + s^5$ $p = s - s^5$

See 3-level graph

M \; N

0	0	0	3	0	0	3	0	0	0	3	3	6	4	6	6	5	3
0	0	0	0	2	0	0	2	0	3	0	2	4	6	4	5	6	6
0	0	0	0	0	1	0	0	1	3	2	0	6	6	6	3	4	6
3	0	0	0	0	0	3	0	0	6	4	6	0	2	0	6	6	6
[0	2	0	0	0	0	0	2	0]	[4	6	6	2	0	2	6	6	4]
0	0	1	0	0	0	0	0	1	6	4	6	0	2	0	6	6	6
3	0	0	3	0	0	0	0	0	6	5	3	6	6	6	0	1	3
0	2	0	0	2	0	0	0	0	5	6	4	6	6	6	1	0	2
0	0	1	0	0	1	0	0	0	3	6	6	6	4	6	3	2	0

$\tau = 27$, $r' = 2/3$

R: [4, 4, 4, 7, 7, 7, 1, 1, 1]
B: [2, 9, 5, 8, 3, 8, 5, 6, 2]

Ranges

Action of R on ranges, [[1], [1], [1]]
Action of B on ranges, [[2], [3], [2]]

Cycles: R , {{1, 4, 7}}, B , {{2, 9}, {3, 5}, {6, 8}}

$\beta(\{1, 4, 7\}) = 1/2$
$\beta(\{2, 5, 8\}) = 1/3$
$\beta(\{3, 6, 9\}) = 1/6$

Partitions

Action of R on partitions, [[2], [2], [2]]
Action of B on partitions, [[3], [3], [1]]

$\alpha([\{1, 8, 9\}, \{2, 3, 7\}, \{4, 5, 6\}]) = 1/6$
$\alpha([\{1, 2, 3\}, \{4, 5, 6\}, \{7, 8, 9\}]) = 1/2$
$\alpha([\{1, 5, 9\}, \{2, 4, 6\}, \{3, 7, 8\}]) = 1/3$

b1 = {1, 2, 3} , b2 = {1, 5, 9} , b3 = {1, 8, 9} , b4 = {2, 3, 7} , b5 = {2, 4, 6} , b6 = {3, 7, 8} , b7 = {4, 5, 6} , b8 = {7, 8, 9}

Action of R and B on the blocks of the partitions: = [8, 8, 8, 7, 1, 7, 1, 7] [2, 4, 5, 2, 3, 7, 6, 5]
with invariant measure [3, 2, 1, 1, 2, 2, 4, 3]

N by blocks, check: true . See partition graph.

See level-3 partition graph.

Sandwich	
Coloring	{}
Rank	3
R,B	[4, 4, 4, 7, 7, 7, 1, 1, 1], [2, 9, 5, 8, 3, 8, 5, 6, 2]
π_2	[0, 0, 3, 0, 0, 3, 0, 0, 0, 0, 2, 0, 0, 2, 0, 0, 0, 1, 0, 0, 1, 0, 0, 3, 0, 0, 0, 0, 2, 0, 0, 0, 1, 0, 0, 0]
u_2	[3, 3, 6, 4, 6, 6, 5, 3, 2, 4, 6, 4, 5, 6, 6, 6, 6, 6, 3, 4, 6, 2, 0, 6, 6, 6, 2, 6, 6, 4, 6, 6, 6, 1, 3, 2] (dim 1)
wpp	[3, 3, 3, 3, 3, 3, 3, 3, 3]
π_3	[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
u_3	[2, 1, 1, 1, 2, 2, 0, 3, 1, 3, 0, 0, 0, 0, 0, 6, 5, 3, 0, 4, 3, 3, 6, 5, 3, 0, 0, 0, 0, 2, 0, 0, 0, 2, 0, 0, 3, 4, 4, 0, 5, 6, 4, 3, 4, 4, 0, 2, 2, 2, 0, 3, 4, 6, 2, 3, 4, 4, 3, 4, 6, 0, 0, 0, 0, 2, 2, 0, 0, 0, 0, 1, 3, 2, 2, 2, 0, 1, 1, 0, 1, 3, 2, 0]

2 . Coloring, {2}

$\Omega p(\Delta)=0$: $p = s^3 - s^4 - 8s^7$

R: [4, 9, 4, 7, 7, 7, 1, 1, 1]
B: [2, 4, 5, 8, 3, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 4	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_4, 0, 0, y_3, 0, 0, y_2, 0, y_1]$$

Omega Rank for B : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[0, 2\,y_2 - y_4, y_1, 2\,y_1 - y_3, y_2, y_3, 0, y_4, 0]$$

$p = - s^3 + s^5$ $p' = s^3 - s^5$

3 . Coloring, {3}

R: [4, 4, 5, 7, 7, 7, 1, 1, 1]
B: [2, 9, 4, 8, 3, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	2 *vs* 4	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_2, 0, 0, y_1, -y_1 + y_2, 0, y_2, 0, 0]$$

$p = -s^2 + s^4$ $p = -s^2 + s^3$

Omega Rank for B : cycles: {{6, 8}, {2, 9}} order: 4

See Matrix

$$[0, y_1 + y_2 + y_3 - y_5, -y_4 + y_1 + y_2 + y_3, y_1, y_2, y_3, 0, y_4, y_5]$$

$p' = s^4 - s^6$ $p = s^4 - s^6$

4 . Coloring, {4}

R: [4, 4, 4, 8, 7, 7, 1, 1, 1]
B: [2, 9, 5, 7, 3, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 8	8 *vs* 8	2 *vs* 4	3 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_2 + y_1, 0, 0, y_2 + y_1, 0, 0, y_2, y_1, 0]$$

$p = -s^2 + s^3$ $p = -s^2 + s^4$

Omega Rank for B : cycles: {{6, 8}, {2, 9}, {3, 5}} order: 2

See Matrix

$$[0, 2\,y_2, 2\,y_2 + y_1 - y_3, 0, y_2 + 2\,y_1, y_2, y_3, y_1, 2\,y_1]$$

$p = -s^2 + s^4$ $p' = -s^2 + s^4$ $p = -s^2 + s^6$ $p' = -s^2 + s^6$

5 . Coloring, {5}

$\Omega p(\Delta)=0$: $p = -s^3 + s^4 + 4s^5 - 8s^7$

R: [4, 4, 4, 7, 3, 7, 1, 1, 1]
B: [2, 9, 5, 8, 7, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 4	2 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_3, 0, y_1, y_2, 0, 0, y_4, 0, 0]$$

Omega Rank for B : cycles: {{6, 8}, {5, 7}, {2, 9}} order: 2

See Matrix

$$[0, y_1, 0, 0, y_1, y_2, y_2, y_1, y_2]$$

$p = -s + s^3$ $p = -s + s^5$ $p' = -s + s^5$ $p' = -s + s^3$

6 . Coloring, {6}

R: [4, 4, 4, 7, 7, 8, 1, 1, 1]
B: [2, 9, 5, 8, 3, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 8	8 *vs* 8	2 *vs* 4	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_2, 0, 0, y_2, 0, 0, y_2 - y_1, y_1, 0]$$

$p = -s^2 + s^4$ $p = -s^2 + s^3$

Omega Rank for B : cycles: {{3, 5}, {2, 9}} order: 4

See Matrix

$$[0, y_1 + y_2 - y_5, y_1 + y_2 - y_3 - y_4, 0, y_1, y_2, y_3, y_4, y_5]$$

$p = s^4 - s^6$ $p' = -s^4 + s^6$

7 . Coloring, {7}

$\Omega p(\Delta)=0$: $p = s^3 - 16s^5 + 8s^6 + 32s^7$ $p' = s^3 - 4s^4 + 8s^6$

R: [4, 4, 4, 7, 7, 7, 5, 1, 1]
B: [2, 9, 5, 8, 3, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
5 *vs* 7	8 *vs* 8	8 *vs* 8	3 *vs* 4	3 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_2 + y_3 - y_1, 0, 0, y_2, y_3, 0, y_1, 0, 0]$$

$p = -s^3 + s^4$

Omega Rank for B : cycles: {{3, 5}, {6, 8}, {2, 9}} order: 2

See Matrix

$$[2\,y_1 + y_2 - y_3, y_1 + 2\,y_2, y_1, 0, y_2, 2\,y_2, 0, 2\,y_1, y_3]$$

$p' = -s^3 + s^5$ $p' = -s^4 + s^6$ $p = s^2 - s^4$ $p' = s^2 - s^4$

8 . Coloring, {8}

$\Omega p(\Delta)=0$: $p = s^2 - 6s^4 + 16s^7$

R: [4, 4, 4, 7, 7, 7, 1, 6, 1]
B: [2, 9, 5, 8, 3, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 4	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$[y_1, 0, 0, y_2, 0, y_3, y_4, 0, 0]$

Omega Rank for B : cycles: {{3, 5}, {2, 9}} order: 4

See Matrix

$[2\,y_1 - y_4, 2\,y_2 - y_3, y_1, 0, y_2, 0, 0, y_3, y_4]$

$p' = s^3 - s^5$ $p = -s^3 + s^5$

9 . Coloring, {9}

R: [4, 4, 4, 7, 7, 7, 1, 1, 2]
B: [2, 9, 5, 8, 3, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	2 *vs* 4	4 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$[-y_1 + y_2, y_1, 0, y_2, 0, 0, y_2, 0, 0]$

$p = s^2 - s^3$ $p' = -s^2 + s^3$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 9}, {6, 8}} order: 6

See Matrix

$$[-y_1 + y_2 + y_3 - y_4, y_1, y_2, 0, y_3, y_2, 0, y_3, y_4]$$

$p' = -s - s^2 + s^4 + s^5$ $p = -s + s^7$ $p = -s - s^2 + s^4 + s^5$

10 . Coloring, {2, 3}

R: [4, 9, 5, 7, 7, 7, 1, 1, 1]
B: [2, 4, 4, 8, 3, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_3, 0, 0, y_2, y_1, 0, y_4, 0, 2\,y_1]$$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{6, 8}} order: 4

See Matrix

$$[0, 4\,y_3, 3\,y_1, 3\,y_2, 3\,y_3, 3\,y_4, 0, 3\,y_5, 0]$$

$p = -s^4 + s^6$

11 . Coloring, {2, 4}

R: [4, 9, 4, 8, 7, 7, 1, 1, 1]
B: [2, 4, 5, 7, 3, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[2\,y_1, 0, 0, 2\,y_2, 0, 0, 3\,y_3, 2\,y_4, 2\,y_3]$$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[0, -y_1 + 4\,y_5 - y_3 + y_4, y_1, -y_2 + y_5 + 4\,y_4, y_2, y_5, y_3, y_4, 0]$$

$p = -s^4 + s^6$ $p' = -s^4 + s^6$

12 . Coloring, {2, 5}

$\Omega p(\Delta)=0$: $p = s^2 - 2s^4 - 16s^7$

R: [4, 9, 4, 7, 3, 7, 1, 1, 1]
B: [2, 4, 5, 8, 7, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_2, 0, y_3, y_1, 0, 0, y_4, 0, y_3]$$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[0, 2\,y_1 - y_4, 0, -y_2 + 2\,y_3, y_1, y_2, y_3, y_4, 0]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$

13 . Coloring, {2, 6}

R: [4, 9, 4, 7, 7, 8, 1, 1, 1]

B: [2, 4, 5, 8, 3, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	7 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, 0, 0, y_2, 0, 0, y_4, y_3, 2\, y_3]$$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{3, 5}} order: 6

See Matrix

$$[0, y_2, y_1, y_4, y_3, y_7, y_6, y_5, 0]$$

14 . Coloring, {2, 7}

R: [4, 9, 4, 7, 7, 7, 5, 1, 1]
B: [2, 4, 5, 8, 3, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_3, 0, 0, y_2, y_1, 0, -y_3 + y_2 + y_1 + y_4, 0, y_4]$$

$p = s^4 - s^5$

Omega Rank for B : cycles: {{6, 8}, {3, 5}} order: 4

See Matrix

$$[2\, y_1 - y_5 + 3\, y_2 - y_3, 3\, y_1 + 2\, y_2 - y_4, y_1, y_5, y_2, y_3, 0, y_4, 0]$$

$p = -s^4 + s^6$ $p' = -s^4 + s^6$

15 . Coloring, {2, 8}

$\Omega p(\Delta)=0$: $p = -s^3 - s^4 + 4s^5 + 8s^7$

R: [4, 9, 4, 7, 7, 7, 1, 6, 1]
B: [2, 4, 5, 8, 3, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	2 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$[y_2, 0, 0, y_1, 0, y_4, y_3, 0, y_4]$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {3, 5}} order: 4

See Matrix

$[y_2, y_1, y_2, y_2, y_1, 0, 0, y_1, 0]$

$p = -s + s^5$ $p' = -s + s^5$ $p' = -s + s^3$ $p = -s + s^3$

16 . Coloring, {2, 9}

R: [4, 9, 4, 7, 7, 7, 1, 1, 2]
B: [2, 4, 5, 8, 3, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}, {2, 9}} order: 6

See Matrix

$$[5\,y_1 - y_2 - y_3 + 5\,y_4, y_1, 0, y_2, 0, 0, y_3, 0, y_4]$$

$p = -s - s^2 + s^4 + s^5$

Omega Rank for B : cycles: {{6, 8}, {3, 5}} order: 4

See Matrix

$$[y_4, 3\,y_4 - 4\,y_3 + 3\,y_2 + 3\,y_1 - y_5, y_3, y_2, 2\,y_4 - 3\,y_3 + 2\,y_2 + 2\,y_1, y_1, 0, y_5, 0]$$

$p' = -s^4 + s^6$ $p = -s^4 + s^6$

17 . Coloring, {3, 4}

R: [4, 4, 5, 8, 7, 7, 1, 1, 1]
B: [2, 9, 4, 7, 3, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	3 *vs* 5	4 *vs* 8

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_2 + y_3, 0, 0, -y_1 + y_2 + y_3, y_1, 0, y_2, y_3, 0]$$

$p = -s^3 + s^4$ $p = -s^3 + s^5$

Omega Rank for B : cycles: {{6, 8}, {3, 4, 5, 7}, {2, 9}} order: 4

See Matrix

$$[0, 2\,y_2 + 2\,y_3 - 4\,y_4, y_1, y_2, y_3, y_2 + y_3 - 2\,y_4, -y_1 + 2\,y_2 + 2\,y_3 - 3\,y_4, y_4, 2\,y_4]$$

$p = -s + s^5$ $p' = -s + s^5$ $p' = -s^2 + s^6$ $p' = -s^3 + s^7$

18 . Coloring, {3, 5}

R: [4, 4, 5, 7, 3, 7, 1, 1, 1]
B: [2, 9, 4, 8, 7, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	3 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}, {3, 5}} order: 6

See Matrix

$$[y_2, 0, y_1, -y_2 + 5\,y_1 + 5\,y_3 - y_4, y_3, 0, y_4, 0, 0]$$

$p = -s - s^2 + s^4 + s^5$

Omega Rank for B : cycles: {{6, 8}, {5, 7}, {2, 9}} order: 2

See Matrix

$$[0, 8\,y_3 + 8\,y_1 - 10\,y_2, 0, y_3, 5\,y_3 + 5\,y_1 - 6\,y_2, y_1, y_2, 6\,y_3 + 6\,y_1 - 7\,y_2, -2\,y_3 - 2\,y_1 + 4\,y_2]$$

$p = -s^2 + s^4$ $p' = -s^2 + s^4$ $p' = -s^2 + s^6$ $p = -s^2 + s^6$

19 . Coloring, {3, 6}

R: [4, 4, 5, 7, 7, 8, 1, 1, 1]
B: [2, 9, 4, 8, 3, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	2 *vs* 5	4 *vs* 8

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1 + y_2, 0, 0, y_1, y_2, 0, y_1, y_2, 0]$$

$p' = -s^2 + s^3$ $p = s^2 - s^3$ $p' = -s^2 + s^4$

Omega Rank for B : cycles: {{3, 4, 5, 6, 7, 8}, {2, 9}} order: 6

See Matrix

$$[0, y_1 + y_2 + y_4 - y_3, y_1, y_2, y_4, y_1, y_2, y_4, y_3]$$

$p = s - s^3 - s^4 + s^6$ $p' = s + s^2 - s^4 - s^5$ $p' = -s^2 - s^3 + s^5 + s^6$ $p' = s^2 - s^4 - s^5 + s^7$

20 . Coloring, {3, 7}

$\Omega p(\Delta)=0$: $p = -s^3 + s^4 - 4s^5 + 8s^7$

R: [4, 4, 5, 7, 7, 7, 5, 1, 1]
B: [2, 9, 4, 8, 3, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	3 *vs* 4	4 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1 + y_2 - y_3, 0, 0, y_1, y_2, 0, y_3, 0, 0]$$

$p = -s^3 + s^4$

Omega Rank for B : cycles: {{2, 9}, {6, 8}} order: 4

See Matrix

$$[9\,y_1 - 6\,y_2 - 6\,y_4 - 3\,y_3,\ 2\,y_1,\ 6\,y_1 - 4\,y_2 - 4\,y_4 - 2\,y_3,\ 2\,y_2,\ 0,\ 2\,y_4,\ 0,\ 2\,y_3,\ -5\,y_1 + 4\,y_2 + 4\,y_4 + 3\,y_3]$$

$p = -s^3 + s^7$ $p = -s^3 + s^5$ $p' = s^3 - s^5$

21 . Coloring, {3, 8}

R: [4, 4, 5, 7, 7, 7, 1, 6, 1]
B: [2, 9, 4, 8, 3, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	7 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, 0, 0, y_2, y_3, 2\,y_3, y_4, 0, 0]$$

$p = s^2 - s^5$

Omega Rank for B : cycles: {{2, 9}} order: 6

See Matrix

$$[y_1, y_2, y_3, y_4, y_5, 0, 0, y_6, y_7]$$

22 . Coloring, {3, 9}

R: [4, 4, 5, 7, 7, 7, 1, 1, 2]
B: [2, 9, 4, 8, 3, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	2 *vs* 5	6 *vs* 8

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, y_2, 0, y_1, y_2, 0, y_1 + y_2, 0, 0]$$

$p = -s^2 + s^3$ $p = -s^2 + s^4$ $p = -s^2 + s^5$

Omega Rank for B : cycles: {{1, 2, 9}, {6, 8}} order: 6

See Matrix

$$[-y_1 + y_2 + y_3 + y_4 - y_6, y_1, -y_5 + y_2 + y_3 + y_4, y_2, y_3, y_4, 0, y_5, y_6]$$

$p' = -s^4 + s^7$ $p = -s^4 + s^7$

23 . Coloring, {4, 5}

R: [4, 4, 4, 8, 3, 7, 1, 1, 1]
B: [2, 9, 5, 7, 7, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	2 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_1, 0, 2\,y_4, y_2, 0, 0, y_4, y_3, 0]$$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{6, 8}, {2, 9}, {5, 7}} order: 2

See Matrix

$$[0, 2\,y_2, 0, 0, y_2 + 2\,y_1, y_2, 2\,y_2 + y_1, y_1, 2\,y_1]$$

$p = -s + s^3$ $p' = -s + s^3$ $p = -s + s^5$ $p' = -s + s^5$

24 . Coloring, {4, 6}

$\Omega p(\Delta)=0$: $p = s^2 + 2s^4 - 16s^7$

R: [4, 4, 4, 8, 7, 8, 1, 1, 1]
B: [2, 9, 5, 7, 3, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	6 *vs* 7	7 *vs* 7	2 *vs* 4	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_2, 0, 0, y_2, 0, 0, y_1, y_2 - y_1, 0]$$

$p = s^2 - s^4$ $p' = s^2 - s^3$

Omega Rank for B : cycles: {{3, 5}, {2, 9}} order: 4

See Matrix

$$[0, y_4, y_3, 0, y_2, y_1, -y_3 + y_2 + y_1, 0, -y_4 + y_2 + y_1]$$

$p' = s^3 - s^5$ $p = s^3 - s^5$

25 . Coloring, {4, 7}

$\Omega p(\Delta)=0$: $p = s - 4s^3 - 4s^4 + 4s^5 + 8s^6$ $p' = s - 4s^3 - 4s^4 + 4s^5 + 8s^6$

R: [4, 4, 4, 8, 7, 7, 5, 1, 1]
B: [2, 9, 5, 7, 3, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
5 *vs* 7	9 *vs* 9	9 *vs* 9	3 *vs* 5	4 *vs* 8

Omega Rank for R : cycles: {{5, 7}, {1, 4, 8}} order: 6

See Matrix

$$[-y_1 + 4\,y_3 - y_2, 0, 0, y_1, y_3, 0, y_3, y_2, 0]$$

$p = s - s^4$ $p' = -s + s^4$

Omega Rank for B : cycles: {{3, 5}, {2, 9}, {6, 8}} order: 4

See Matrix

$$[y_4 + 3\,y_2 - y_1, 3\,y_4 - y_3 + y_2, y_4, 0, y_2, y_4, y_3, y_2, y_1]$$

$p' = s^5 - s^7$ $p' = s^4 - s^6$ $p' = s^3 - s^7$ $p = s^3 - s^7$

26 . Coloring, {4, 8}

R: [4, 4, 4, 8, 7, 7, 1, 6, 1]
B: [2, 9, 5, 7, 3, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 5	4 *vs* 7

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}} order: 5

See Matrix

$$[y_1, 0, 0, y_2, 0, y_3, y_4, y_5, 0]$$

Omega Rank for B : cycles: {{3, 5}, {2, 9}} order: 4

See Matrix

$$[y_4 - y_2, y_3 + 2\,y_1, y_3, 0, y_4, 0, 3\,y_1, y_1, y_2]$$

$p' = -s^4 + s^6$ $p' = -s^3 + s^5$ $p = s^3 - s^5$

27 . Coloring, {4, 9}

R: [4, 4, 4, 8, 7, 7, 1, 1, 2]
B: [2, 9, 5, 7, 3, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	2 *vs* 5	5 *vs* 8

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[-y_2 + y_1, y_2, 0, y_1, 0, 0, 3\,y_2, -3\,y_2 + y_1, 0]$$

$p = s^2 - s^3$ $p' = -s^2 + s^3$ $p' = -s^2 + s^4$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 9}, {6, 8}} order: 6

See Matrix

$$[y_1, -y_1 + 2\,y_5 + 2\,y_3 - y_2, 2\,y_5 + y_3 - y_4, 0, y_5 + 2\,y_3, y_5, y_4, y_3, y_2]$$

$p = -s^2 + s^8$ $p = s^2 - s^4 - s^5 + s^7$ $p = -s^2 - s^3 + s^5 + s^6$

28 . Coloring, {5, 6}

R: [4, 4, 4, 7, 3, 8, 1, 1, 1]
B: [2, 9, 5, 8, 7, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, 0, 2\,y_4, y_2, 0, 0, y_3, y_4, 0]$$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{2, 9}, {5, 7}} order: 4

See Matrix

$$[0, y_1 + y_3 - y_4, 0, 0, -y_2 + y_1 + y_3, y_2, y_1, y_3, y_4]$$

$p' = s^3 - s^5$ $p = -s^3 + s^5$

29 . Coloring, {5, 7}

R: [4, 4, 4, 7, 3, 7, 5, 1, 1]
B: [2, 9, 5, 8, 7, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	5 *vs* 7

Omega Rank for R : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_3, 0, y_4, y_2, y_3 + y_4 - y_2 + y_1, 0, y_1, 0, 0]$$

$p = -s^2 + s^3 - s^4 + s^5$

Omega Rank for B : cycles: {{2, 9}, {6, 8}} order: 4

See Matrix

$$[-y_1 + y_2 + y_3 - y_5, y_2 + y_3 - y_4, 0, 0, y_1, y_2, y_4, y_3, y_5]$$

$p = -s^4 + s^6$ $p' = -s^4 + s^6$

30 . Coloring, {5, 8}

Ωp(Δ)=0: $p = s^3 - 3s^4 + 8s^7$

R: [4, 4, 4, 7, 3, 7, 1, 6, 1]

B: [2, 9, 5, 8, 7, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, 0, y_3, y_2, 0, y_3, y_4, 0, 0]$$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{2, 9}, {5, 7}} order: 4

See Matrix

$$[2\,y_1 - y_3, 2\,y_2 - y_4, 0, 0, y_2, 0, y_1, y_4, y_3]$$

$p = s^3 - s^5$ $p' = s^3 - s^5$

31 . Coloring, {5, 9}

R: [4, 4, 4, 7, 3, 7, 1, 1, 2]
B: [2, 9, 5, 8, 7, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	4 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_3, y_4, 2\,y_4, y_1, 0, 0, y_2, 0, 0]$$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{1, 2, 9}, {5, 7}, {6, 8}} order: 6

See Matrix

$$[y_4, y_2, 0, 0, y_3, y_1, y_1, y_3, -y_4 - y_2 + y_3 + y_1]$$

$p = s - s^3 - s^4 + s^6$ $p = -s + s^7$ $p = s + s^2 - s^4 - s^5$

32 . Coloring, {6, 7}

R: [4, 4, 4, 7, 7, 8, 5, 1, 1]
B: [2, 9, 5, 8, 3, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 5	6 *vs* 8

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_4, 0, 0, y_3, y_2, 0, y_1, y_5, 0]$$

Omega Rank for B : cycles: {{2, 9}, {3, 5}} order: 6

See Matrix

$$[y_4, y_3, y_2, 0, y_1, -y_4 + 2y_2 + 3y_1 - y_6, -y_3 + 3y_2 + 2y_1 - y_5, y_5, y_6]$$

$p' = s^5 - s^7$ $p = s^5 - s^7$

33 . Coloring, {6, 8}

R: [4, 4, 4, 7, 7, 8, 1, 6, 1]
B: [2, 9, 5, 8, 3, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	4 *vs* 7

Omega Rank for R : cycles: {{6, 8}, {1, 4, 7}} order: 6

See Matrix

$$[y_1, 0, 0, -y_1 + 5y_2 - y_3 + 5y_4, 0, y_2, y_3, y_4, 0]$$

$p = -s - s^2 + s^4 + s^5$

Omega Rank for B : cycles: {{2, 9}, {3, 5}} order: 4

See Matrix

$$[-16\,y_3 + 33\,y_2 - 48\,y_1 - 5\,y_4,\ 5\,y_3,\ -7\,y_3 + 16\,y_2 - 26\,y_1,\ 0,\ 5\,y_2,\ 0,\ 5\,y_1,\ 15\,y_1,\ 5\,y_4]$$

$p = -s^3 + s^7$ $p' = -s^3 + s^5$ $p = -s^3 + s^5$

34 . Coloring, {6, 9}

R: [4, 4, 4, 7, 7, 8, 1, 1, 2]
B: [2, 9, 5, 8, 3, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	2 *vs* 5	6 *vs* 8

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1,\ y_2,\ 0,\ y_2 + y_1,\ 0,\ 0,\ y_1,\ y_2,\ 0]$$

$p = -s^2 + s^3$ $p = -s^2 + s^4$ $p = -s^2 + s^5$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 9}} order: 6

See Matrix

$$[-y_1 + y_2 + y_6 - y_5,\ y_1,\ y_2 + y_6 - y_3 - y_4,\ 0,\ y_2,\ y_6,\ y_3,\ y_4,\ y_5]$$

$p = -s^4 + s^7$ $p' = -s^4 + s^7$

35 . Coloring, {7, 8}

R: [4, 4, 4, 7, 7, 7, 5, 6, 1]
B: [2, 9, 5, 8, 3, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	4 *vs* 6

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1, 0, 0, y_3, y_2, 2\,y_1, y_4, 0, 0]$$

$p = s^3 - s^5$

Omega Rank for B : cycles: {{3, 5}, {2, 9}} order: 4

See Matrix

$$[2\,y_1 + 3\,y_3 - y_4, 3\,y_1 + 2\,y_3 - y_2, y_1, 0, y_3, 0, 0, y_2, y_4]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$

36 . Coloring, {7, 9}

R: [4, 4, 4, 7, 7, 7, 5, 1, 2]
B: [2, 9, 5, 8, 3, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	7 *vs* 7	7 *vs* 7	3 *vs* 5	4 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[2\,y_1, y_1, 0, 3\,y_1 - y_3 + y_2, y_3, 0, y_2, 0, 0]$$

$p' = -s^3 + s^4$ $p = s^3 - s^4$

Omega Rank for B : cycles: {{3, 5}, {6, 8}, {1, 2, 9}} order: 6

See Matrix

$$[y_1, -y_1 + 3\,y_2 + 3\,y_3 - y_4, y_2, 0, y_3, 2\,y_3, 0, 2\,y_2, y_4]$$

$p = -s - s^2 + s^4 + s^5$ $p = s - s^3 - s^4 + s^6$ $p = -s + s^7$

37 . Coloring, {8, 9}

R: [4, 4, 4, 7, 7, 7, 1, 6, 2]
B: [2, 9, 5, 8, 3, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, y_2, 0, y_3, 0, 2\,y_2, y_4, 0, 0]$$

$p = s^2 - s^5$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 9}} order: 6

See Matrix

$$[-y_1 + 2\,y_2 + 2\,y_3 - y_4 - y_5, y_1, y_2, 0, y_3, 0, 0, y_4, y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$

38 . Coloring, {2, 3, 4}

R: [4, 9, 5, 8, 7, 7, 1, 1, 1]
B: [2, 4, 4, 7, 3, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_1, 0, 0, y_5, y_4, 0, y_3, y_2, 2\,y_4]$$

$p = -s^3 + s^6$

Omega Rank for B : cycles: {{3, 4, 5, 7}, {6, 8}} order: 4

See Matrix

$$[0, -y_1 + 4\,y_3 - y_4 + y_5, y_1, -y_2 + y_3 + 4\,y_5, y_2, y_3, y_4, y_5, 0]$$

$p' = -s^2 + s^6$ $p = -s^2 + s^6$

39 . Coloring, {2, 3, 5}

R: [4, 9, 5, 7, 3, 7, 1, 1, 1]
B: [2, 4, 4, 8, 7, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	4 *vs* 6

Omega Rank for R : cycles: {{3, 5}, {1, 4, 7}} order: 6

See Matrix

$$[y_5, 0, y_4, y_3, y_2, 0, y_1, 0, -y_5 + 5\,y_4 - y_3 + 5\,y_2 - y_1]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[0, y_4, 0, y_3, -5\,y_3 - 5\,y_2 + 14\,y_1, y_2, y_1, -y_4 - 14\,y_3 - 14\,y_2 + 39\,y_1, 0]$$

$p' = s^3 - s^5$ $p = s^3 - s^5$

40 . Coloring, {2, 3, 6}

R: [4, 9, 5, 7, 7, 8, 1, 1, 1]
B: [2, 4, 4, 8, 3, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	4 *vs* 6	7 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, 0, 0, y_2, y_4, 0, y_3, y_4, 2\,y_4]$$

$p' = -s^2 + s^5$ $p = s^2 - s^5$

Omega Rank for B : cycles: {{3, 4, 5, 6, 7, 8}} order: 6

See Matrix

$$[0, y_1, y_2, y_3, y_4, y_5, y_6, y_7, 0]$$

41 . Coloring, {2, 3, 7}

$\Omega p(\Delta)=0$: $p = s^2 + 6s^4 + 16s^7$

R: [4, 9, 5, 7, 7, 7, 5, 1, 1]
B: [2, 4, 4, 8, 3, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	5 *vs* 6

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1 + y_2 - y_3 + y_4, 0, 0, y_1, y_2, 0, y_3, 0, y_4]$$

$p = -s^4 + s^5$

Omega Rank for B : cycles: {{6, 8}} order: 4

See Matrix

$$[3\,y_2, 2\,y_1, 2\,y_2, 2\,y_5, 0, 2\,y_4, 0, 2\,y_3, 0]$$

$p = -s^4 + s^6$

42 . Coloring, {2, 3, 8}

R: [4, 9, 5, 7, 7, 7, 1, 6, 1]
B: [2, 4, 4, 8, 3, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	6 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, 0, 0, y_2, y_3, 2\,y_3, y_4, 0, 2\,y_3]$$

$p = -s^2 + s^5$ $p' = -s^2 + s^5$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1, y_4, y_5, y_6, y_3, 0, 0, y_2, 0]$$

43 . Coloring, {2, 3, 9}

$\Omega p(\Delta)=0$: $p = s^2 + 2s^3 - 4s^5 - 8s^6 - 16s^7$

R: [4, 9, 5, 7, 7, 7, 1, 1, 2]
B: [2, 4, 4, 8, 3, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	4 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}, {2, 9}} order: 6

See Matrix

$$[5\,y_1 - y_4 - y_3 - y_2 + 5\,y_5, y_1, 0, y_4, y_3, 0, y_2, 0, y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{6, 8}} order: 4

See Matrix

$$[y_2, y_1, -7\,y_2 + 3\,y_1, -11\,y_2 + 4\,y_1 - y_4 + y_3, 3\,y_2, y_4, 0, y_3, 0]$$

$p = s^4 - s^7$ $p' = s^5 - s^6$ $p' = s^4 - s^6$

44 . Coloring, {2, 4, 5}

R: [4, 9, 4, 8, 3, 7, 1, 1, 1]
B: [2, 4, 5, 7, 7, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_1, 0, 2\,y_4, y_2, 0, 0, y_4, y_3, 2\,y_4]$$

$p' = s^2 - s^5$ $p = -s^2 + s^5$

Omega Rank for B : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[0, 4\,y_3 + 4\,y_4 - 15\,y_1 - y_2, 0, y_3, y_4, y_3 + y_4 - 4\,y_1, y_2, y_1, 0]$$

$p' = -s^3 + s^5$ $p = -s^3 + s^5$

45 . Coloring, {2, 4, 6}

$\Omega p(\Delta)=0$: $p = s^3 + s^4 + 4s^5 + 8s^7$

R: [4, 9, 4, 8, 7, 8, 1, 1, 1]
B: [2, 4, 5, 7, 3, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_1, 0, 0, y_2, 0, 0, y_4, y_3, y_4]$$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{3, 5}} order: 4

See Matrix

$$[0, 2\,y_4, y_1, y_2, y_3, y_4, y_5, 0, 0]$$

$p = -s^4 + s^6$

46 . Coloring, {2, 4, 7}

R: [4, 9, 4, 8, 7, 7, 5, 1, 1]
B: [2, 4, 5, 7, 3, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	4 *vs* 6	4 *vs* 8

Omega Rank for R : cycles: {{5, 7}, {1, 4, 8}} order: 6

See Matrix

$$[-y_3 + 4\,y_2 - y_1 - y_4, 0, 0, y_3, y_2, 0, y_2, y_1, y_4]$$

$p' = s^2 - s^5$ $p = s^2 - s^5$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 4, 7}, {6, 8}} order: 4

See Matrix

$$[y_2 - y_1 + 3\,y_4, 3\,y_2 + y_4 - y_3, y_2, y_1, y_4, y_2, y_3, y_4, 0]$$

$p' = -s^3 + s^7$ $p = -s + s^5$ $p' = -s^2 + s^6$ $p' = -s + s^5$

47 . Coloring, {2, 4, 8}

R: [4, 9, 4, 8, 7, 7, 1, 6, 1]
B: [2, 4, 5, 7, 3, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 6	7 *vs* 7

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}} order: 5

See Matrix

$$[y_1, 0, 0, y_5, 0, y_2, y_3, y_4, y_6]$$

Omega Rank for B : cycles: {{3, 5}} order: 6

See Matrix

$$[y_1, y_2, y_3, y_6, y_7, 0, y_4, y_5, 0]$$

48 . Coloring, {2, 4, 9}

Ωp(Δ)=0: $p = s^2 - 2s^3 + 4s^5 + 8s^6 - 16s^7$

R: [4, 9, 4, 8, 7, 7, 1, 1, 2]
B: [2, 4, 5, 7, 3, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 6	6 *vs* 8

Omega Rank for R : cycles: {{2, 9}, {1, 4, 8}} order: 6

See Matrix

$$[5\,y_1 - y_2 - y_4 - y_3 + 5\,y_5, y_1, 0, y_2, 0, 0, y_4, y_3, y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{3, 5}, {6, 8}} order: 6

See Matrix

$$[-y_3 - y_4 + 2\,y_2 + 3\,y_5, -y_1 + 3\,y_2 - y_6 + 2\,y_5, y_1, y_3, y_4, y_2, y_6, y_5, 0]$$

$p' = -s^5 + s^7$ $p = -s^5 + s^7$

49 . Coloring, {2, 5, 6}

R: [4, 9, 4, 7, 3, 8, 1, 1, 1]
B: [2, 4, 5, 8, 7, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	6 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, 0, 2\,y_4, y_3, 0, 0, y_2, y_4, 2\,y_4]$$

$p = -s^2 + s^5$ $p' = -s^2 + s^5$

Omega Rank for B : cycles: {{5, 7}} order: 6

See Matrix

$$[0, y_1, 0, y_4, y_2, y_3, y_6, y_5, 0]$$

50 . Coloring, {2, 5, 7}

R: [4, 9, 4, 7, 3, 7, 5, 1, 1]
B: [2, 4, 5, 8, 7, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	7 *vs* 7

Omega Rank for R : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[-y_1 + y_2 + y_3 - y_4 + y_5, 0, y_1, y_2, y_3, 0, y_4, 0, y_5]$$

$p = -s^3 + s^4 - s^5 + s^6$

Omega Rank for B : cycles: {{6, 8}} order: 6

See Matrix

$$[y_1, y_2, 0, y_3, y_4, y_5, y_6, y_7, 0]$$

51 . Coloring, {2, 5, 8}

$\Omega p(\Delta)=0$: $p' = s^5 - 2s^6$ $p' = s^2 - 16s^6$ $p' = s^4 - 4s^6$ $p' = s^3 - 8s^6$ $p = s^2 - 32s^7$

R: [4, 9, 4, 7, 3, 7, 1, 6, 1]
B: [2, 4, 5, 8, 7, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
2 *vs* 7	2 *vs* 7	2 *vs* 7	2 *vs* 6	2 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, 0, y_2, y_1, 0, y_2, y_1, 0, y_2]$$

$p = -s^2 + s^3$ $p = -s^2 + s^4$ $p = -s^2 + s^5$ $p = -s^2 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {5, 7}} order: 4

See Matrix

$$[y_1, y_2, 0, y_1, y_2, 0, y_1, y_2, 0]$$

$p' = -s + s^3$ $p = -s + s^5$ $p' = -s + s^5$ $p = -s + s^3$

See 3-level graph

M \; N

0	0	0	3	0	0	3	0	0	0	16	10	20	16	20	20	8	10
0	0	0	0	2	0	0	2	0	16	0	17	12	20	12	12	20	11
0	0	0	0	0	1	0	0	1	10	17	0	20	15	20	10	8	20
3	0	0	0	0	0	3	0	0	20	12	20	0	14	0	20	14	20
[0	2	0	0	0	0	0	2	0]	[16	20	15	14	0	14	10	20	11]
0	0	1	0	0	0	0	0	1	20	12	20	0	14	0	20	14	20
3	0	0	3	0	0	0	0	0	20	12	10	20	10	20	0	18	10
0	2	0	0	2	0	0	0	0	8	20	8	14	20	14	18	0	18
0	0	1	0	0	1	0	0	0	10	11	20	20	11	20	10	18	0

τ= 27 , r'= 2/3

R: [4, 9, 4, 7, 3, 7, 1, 6, 1]
B: [2, 4, 5, 8, 7, 8, 5, 1, 2]

Ranges

Action of R on ranges, [[1], [3], [1]]
Action of B on ranges, [[2], [1], [2]]

Cycles: R , {{1, 4, 7}}, B , {{1, 2, 4, 8}, {5, 7}}

β({1, 4, 7}) = 1/2
β({2, 5, 8}) = 1/3
β({3, 6, 9}) = 1/6

Partitions

Action of R on partitions, [[2], [4], [2], [4], [2], [2], [2], [2]]
Action of B on partitions, [[3], [5], [1], [3], [6], [8], [5], [7]]

α([{1, 8, 9}, {2, 4, 6}, {3, 5, 7}]) = 1/12
α([{1, 3, 8}, {2, 7, 9}, {4, 5, 6}]) = 1/4
α([{1, 2, 9}, {3, 5, 7}, {4, 6, 8}]) = 1/6
α([{1, 3, 8}, {2, 4, 6}, {5, 7, 9}]) = 1/4
α([{1, 5, 9}, {2, 3, 7}, {4, 6, 8}]) = 2/15
α([{1, 5, 9}, {2, 4, 6}, {3, 7, 8}]) = 1/15
α([{1, 8, 9}, {2, 3, 7}, {4, 5, 6}]) = 1/60
α([{1, 2, 9}, {3, 7, 8}, {4, 5, 6}]) = 1/30

b1 = {1, 2, 9} , b2 = {1, 3, 8} , b3 = {1, 5, 9} , b4 = {1, 8, 9} , b5 = {2, 3, 7} , b6 = {2, 4, 6} , b7 = {2, 7, 9} , b8 = {3, 5, 7} , b9 = {3, 7, 8} , b10 = {4, 5, 6} , b11 = {4, 6, 8} , b12 = {5, 7, 9}

Action of R and B on the blocks of the partitions: = [7, C, 7, 7, A, 2, 6, A, A, 2, 2, 6] [4, B, 9, B, 3, 1, 3, 8, A, 5, 6, 8] with invariant measure [4, 10, 4, 2, 3, 8, 5, 5, 2, 6, 6, 5]

N by blocks, check: true . See partition graph.

See level-3 partition graph.

Sandwich	
Coloring	{2, 5, 8}
Rank	3
R,B	[4, 9, 4, 7, 3, 7, 1, 6, 1], [2, 4, 5, 8, 7, 8, 5, 1, 2]
π_2	[0, 0, 3, 0, 0, 3, 0, 0, 0, 0, 2, 0, 0, 2, 0, 0, 0, 1, 0, 0, 1, 0, 0, 3, 0, 0, 0, 0, 2, 0, 0, 0, 1, 0, 0, 0]
u_2	[16, 10, 20, 16, 20, 20, 8, 10, 17, 12, 20, 12, 12, 20, 11, 20, 15, 20, 10, 8, 20, 14, 0, 20, 14, 20, 14, 10, 20, 11, 20, 14, 20, 18, 10, 18] (dim 1)
wpp	[3, 3, 3, 3, 3, 3, 3, 3, 3]
π_3	[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]

u_3	[3, 8, 12, 8, 8, 4, 5, 10, 1, 10, 0, 6, 0, 10, 0, 20, 2, 10, 10, 6, 4, 5, 20, 2, 10, 6, 0, 0, 9, 12, 9, 5, 5, 8, 6, 0, 4, 6, 3, 6, 2, 20, 2, 4, 6, 3, 10, 3, 9, 9, 0, 10, 2, 20, 9, 5, 3, 6, 10, 2, 20, 0, 0, 6, 0, 4, 8, 5, 0, 0, 0, 12, 10, 12, 4, 8, 5, 8, 1, 9, 12, 10, 12, 6]

52 . Coloring, {2, 5, 9}

R: [4, 9, 4, 7, 3, 7, 1, 1, 2]
B: [2, 4, 5, 8, 7, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {1, 4, 7}} order: 6

See Matrix

$$[y_5, y_4, y_3, y_2, 0, 0, -y_5 + 5\,y_4 - y_3 - y_2 + 5\,y_1, 0, y_1]$$

$$p = -s^2 - s^3 + s^5 + s^6$$

Omega Rank for B : cycles: {{6, 8}, {5, 7}} order: 4

See Matrix

$$[3\,y_1 - y_3 - 4\,y_4 - y_5 + 3\,y_2, y_1, 0, y_3, y_4, y_5, 2\,y_1 - 3\,y_4 + 2\,y_2, y_2, 0]$$

$$p = -s^4 + s^6 \quad p' = -s^4 + s^6$$

53 . Coloring, {2, 6, 7}

R: [4, 9, 4, 7, 7, 8, 5, 1, 1]
B: [2, 4, 5, 8, 3, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 6	6 *vs* 8

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1, 0, 0, y_2, y_3, 0, y_4, y_5, 2\,y_5]$$

$p = s^4 - s^6$

Omega Rank for B : cycles: {{1, 2, 4, 6, 7, 8}, {3, 5}} order: 6

See Matrix

$$[2\,y_1 - y_3 + 3\,y_2 - y_6, 3\,y_1 + 2\,y_2 - y_5 - y_4, y_1, y_3, y_2, y_6, y_5, y_4, 0]$$

$p = -s + s^7$ $p' = -s + s^7$

54 . Coloring, {2, 6, 8}

R: [4, 9, 4, 7, 7, 8, 1, 6, 1]
B: [2, 4, 5, 8, 3, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{6, 8}, {1, 4, 7}} order: 6

See Matrix

$$[-y_3 + 5\,y_1 - y_2 + 5\,y_4 - y_5, 0, 0, y_3, 0, y_1, y_2, y_4, y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {3, 5}} order: 4

See Matrix

$$[-16\,y_1 - 5\,y_3 + 33\,y_2 - 16\,y_5, 5\,y_1, -7\,y_1 + 16\,y_2 - 5\,y_4 - 7\,y_5, 5\,y_3, 5\,y_2, 0, 5\,y_4, 5\,y_5, 0]$$

$p' = -s^2 + s^6$ $p = -s^2 + s^6$

55 . Coloring, {2, 6, 9}

R: [4, 9, 4, 7, 7, 8, 1, 1, 2]
B: [2, 4, 5, 8, 3, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 6	7 *vs* 8

Omega Rank for R : cycles: {{1, 4, 7}, {2, 9}} order: 6

See Matrix

$$[5\,y_1 - y_5 - y_4 - y_2 + 5\,y_3,\ y_1,\ 0,\ y_5,\ 0,\ 0,\ y_4,\ y_2,\ y_3]$$

$p = s^2 + s^3 - s^5 - s^6$

Omega Rank for B : cycles: {{3, 5}} order: 8

See Matrix

$$[y_1,\ y_1 - y_3 + y_4 + y_2 + y_5 - y_6 - y_7,\ y_3,\ y_4,\ y_2,\ y_5,\ y_6,\ y_7,\ 0]$$

$p = -s^7 + s^8$

56 . Coloring, {2, 7, 8}

R: [4, 9, 4, 7, 7, 7, 5, 6, 1]
B: [2, 4, 5, 8, 3, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	4 *vs* 6

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1,\ 0,\ 0,\ y_2,\ y_3,\ y_5,\ y_4,\ 0,\ y_5]$$

$p = -s^4 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {3, 5}} order: 4

See Matrix

$$[2\,y_1 - y_2 + 3\,y_3,\ 3\,y_1 + 2\,y_3 - y_4,\ y_1,\ y_2,\ y_3,\ 0,\ 0,\ y_4,\ 0]$$

$p = -s + s^5$ $p' = -s + s^5$

57 . Coloring, {2, 7, 9}

R: [4, 9, 4, 7, 7, 7, 5, 1, 2]
B: [2, 4, 5, 8, 3, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {5, 7}} order: 4

See Matrix

$$[2\,y_1 - y_3 + 3\,y_2,\ y_1,\ 0,\ y_4,\ 3\,y_1 - y_4 + 2\,y_2,\ 0,\ y_3,\ 0,\ y_2]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$

Omega Rank for B : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[y_2,\ 2\,y_1 + 3\,y_5 - y_4,\ y_1,\ -y_2 + 3\,y_1 + 2\,y_5 - y_3,\ y_5,\ y_3,\ 0,\ y_4,\ 0]$$

$p = -s^4 + s^6$ $p' = -s^4 + s^6$

58 . Coloring, {2, 8, 9}

R: [4, 9, 4, 7, 7, 7, 1, 6, 2]
B: [2, 4, 5, 8, 3, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	4 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {1, 4, 7}} order: 6

See Matrix

$$[5\,y_4 - y_3 - y_2 - y_1 + 5\,y_5,\ y_4,\ 0,\ y_3,\ 0,\ y_2,\ y_1,\ 0,\ y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {3, 5}} order: 4

See Matrix

$$[y_3, 3\,y_3 - 4\,y_1 + 3\,y_2 - y_4, y_1, y_2, 2\,y_3 - 3\,y_1 + 2\,y_2, 0, 0, y_4, 0]$$

$p = -s + s^5$ $p' = -s + s^5$

59 . Coloring, {3, 4, 5}

R: [4, 4, 5, 8, 3, 7, 1, 1, 1]
B: [2, 9, 4, 7, 7, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 6	3 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}, {3, 5}} order: 6

See Matrix

$$[5\,y_1 - y_5 + 5\,y_4 - y_3 - y_2, 0, y_1, y_5, y_4, 0, y_3, y_2, 0]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{2, 9}, {5, 7}, {6, 8}} order: 2

See Matrix

$$[0, 2\,y_1, 0, -y_3 + y_1 + 2\,y_2, y_3, y_1, 2\,y_1 + y_2, y_2, 2\,y_2]$$

$p = -s^2 + s^4$ $p' = -s^2 + s^4$ $p = -s^2 + s^6$ $p' = -s^2 + s^6$

60 . Coloring, {3, 4, 6}

R: [4, 4, 5, 8, 7, 8, 1, 1, 1]
B: [2, 9, 4, 7, 3, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	3 *vs* 5	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_2 + y_3, 0, 0, -y_1 + y_2 + y_3, y_1, 0, y_2, y_3, 0]$$

$p = -s^3 + s^4$ $p = -s^3 + s^5$

Omega Rank for B : cycles: {{2, 9}, {3, 4, 5, 7}} order: 4

See Matrix

$$[0, y_5 + y_3 + y_2 - y_1, y_4, y_5, y_3, y_2, -y_4 + y_5 + y_3 + y_2, 0, y_1]$$

$p = -s^2 + s^6$ $p' = -s^2 + s^6$

61 . Coloring, {3, 4, 7}

R: [4, 4, 5, 8, 7, 7, 5, 1, 1]
B: [2, 9, 4, 7, 3, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	6 *vs* 8

Omega Rank for R : cycles: {{5, 7}, {1, 4, 8}} order: 6

See Matrix

$$[-7y_1 + 11y_2 + 11y_3 - 7y_4, 0, 0, 7y_1, 7y_2, 0, 7y_3, 7y_4, 0]$$

$p = -s - s^2 + s^4 + s^5$

Omega Rank for B : cycles: {{2, 9}, {6, 8}} order: 6

See Matrix

$$[-y_2 + y_3 + 4y_5 - y_6, -y_1 + 4y_3 - y_4 + y_5, y_1, y_2, 0, y_3, y_4, y_5, y_6]$$

$p = -s^5 + s^7$ $p' = -s^5 + s^7$

62 . Coloring, {3, 4, 8}

R: [4, 4, 5, 8, 7, 7, 1, 6, 1]
B: [2, 9, 4, 7, 3, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 6	6 *vs* 8

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}} order: 5

See Matrix

$$[y_1, 0, 0, y_5, y_6, y_3, y_4, y_2, 0]$$

Omega Rank for B : cycles: {{2, 9}, {3, 4, 5, 7}} order: 4

See Matrix

$$[y_6, y_5, y_4, y_3, y_2, 0, y_1, -y_5 + y_4 + y_1, -y_6 + y_3 + y_2]$$

$p' = s^3 - s^7$ $p = s^3 - s^7$

63 . Coloring, {3, 4, 9}

R: [4, 4, 5, 8, 7, 7, 1, 1, 2]
B: [2, 9, 4, 7, 3, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 9	9 *vs* 9	3 *vs* 6	6 *vs* 9

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[-y_1 + y_2 + y_3, y_1, 0, -y_1 + y_2 + y_3, y_1, 0, y_2, y_3, 0]$$

$p' = -s^3 + s^5$ $p = s^3 - s^4$ $p' = -s^3 + s^4$

Omega Rank for B : cycles: {{3, 4, 5, 7}, {1, 2, 9}, {6, 8}}

See Matrix

$$[-y_1 + 2y_3 + 2y_5 - y_6, y_1, 2y_3 + y_5 - y_4, -y_2 + y_3 + 2y_5, y_2, y_3, y_4, y_5, y_6]$$

$p' = -1 - s - s^2 + s^4 + s^5 + s^6$ $p' = 1 - s^3 - s^4 + s^7$ $p' = s - s^4 - s^5 + s^8$

64 . Coloring, {3, 5, 6}

R: [4, 4, 5, 7, 3, 8, 1, 1, 1]
B: [2, 9, 4, 8, 7, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}, {3, 5}} order: 6

See Matrix

$$[5\,y_1 - y_2 + 5\,y_3 - y_4 - y_5,\ 0,\ y_1,\ y_2,\ y_3,\ 0,\ y_4,\ y_5,\ 0]$$

$$p = -s^2 - s^3 + s^5 + s^6$$

Omega Rank for B : cycles: {{2, 9}, {5, 7}} order: 4

See Matrix

$$[0,\ y_3,\ 0,\ y_3 - y_1 - y_2 + y_5,\ y_1,\ y_2,\ y_3 - y_4 + y_5,\ y_4,\ y_5]$$

$$p' = -s^4 + s^6 \quad p = -s^4 + s^6$$

65 . Coloring, {3, 5, 7}

$\Omega p(\Delta)=0$: $p = s^2 - 2s^4 + 8s^5 - 16s^7$

R: [4, 4, 5, 7, 3, 7, 5, 1, 1]
B: [2, 9, 4, 8, 7, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	4 *vs* 7

Omega Rank for R : cycles: {{3, 5}} order: 4

See Matrix

$$[-y_1 + y_2 + y_3 - y_4,\ 0,\ y_1,\ y_2,\ y_3,\ 0,\ y_4,\ 0,\ 0]$$

$p = s^4 - s^5$

Omega Rank for B : cycles: {{6, 8}, {2, 9}} order: 4

See Matrix

$$[2\,y_1,\ 9\,y_1 - 15\,y_3 - 11\,y_2 + 9\,y_4,\ 0,\ 2\,y_3,\ 0,\ 2\,y_2,\ 4\,y_3,\ 7\,y_1 - 9\,y_3 - 9\,y_2 + 7\,y_4,\ 2\,y_4]$$

$p = s^3 - s^5$ $p' = -s^4 + s^6$ $p' = s^3 - s^5$

66 . Coloring, {3, 5, 8}

R: [4, 4, 5, 7, 3, 7, 1, 6, 1]
B: [2, 9, 4, 8, 7, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}, {3, 5}} order: 6

See Matrix

$$[5\,y_2 - y_3 + 5\,y_1 - y_4 - y_5,\ 0,\ y_2,\ y_3,\ y_1,\ y_4,\ y_5,\ 0,\ 0]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{5, 7}, {2, 9}} order: 4

See Matrix

$$[-14\,y_4 - y_2 + 39\,y_3 - 14\,y_1 - y_5,\ y_4,\ 0,\ y_2,\ y_3,\ 0,\ -5\,y_4 + 14\,y_3 - 5\,y_1,\ y_1,\ y_5]$$

$p = -s^4 + s^6$ $p' = s^4 - s^6$

67 . Coloring, {3, 5, 9}

R: [4, 4, 5, 7, 3, 7, 1, 1, 2]
B: [2, 9, 4, 8, 7, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 8

Omega Rank for R : cycles: {{1, 4, 7}, {3, 5}} order: 6

See Matrix

$$[y_4, y_5, y_3, y_1, y_2, 0, -y_4 - y_5 + 5\, y_3 - y_1 + 5\, y_2, 0, 0]$$

$p = s^2 + s^3 - s^5 - s^6$

Omega Rank for B : cycles: {{6, 8}, {5, 7}, {1, 2, 9}} order: 6

See Matrix

$$[-y_1 + 6\, y_2 + 6\, y_3 - 6\, y_4 - y_5, y_1, 0, y_2, 5\, y_2 + 5\, y_3 - 6\, y_4, y_3, y_4, 6\, y_2 + 6\, y_3 - 7\, y_4, y_5]$$

$p = - s^2 - s^3 + s^5 + s^6$ $p = - s^2 + s^8$ $p = s^2 - s^4 - s^5 + s^7$

68 . Coloring, {3, 6, 7}

R: [4, 4, 5, 7, 7, 8, 5, 1, 1]
B: [2, 9, 4, 8, 3, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 5	8 *vs* 8

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1, 0, 0, y_2, y_3, 0, y_4, y_5, 0]$$

Omega Rank for B : cycles: {{2, 9}} order: 8

See Matrix

$$[y_1, y_2, y_3, y_4, 0, y_5, y_6, y_7, y_8]$$

69 . Coloring, {3, 6, 8}

R: [4, 4, 5, 7, 7, 8, 1, 6, 1]
B: [2, 9, 4, 8, 3, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 6	8 *vs* 8

Omega Rank for R : cycles: {{1, 4, 7}, {6, 8}} order: 6

See Matrix

$$[-y_4 - y_2 + 5\,y_3 - y_1 + 5\,y_5, 0, 0, y_4, y_2, y_3, y_1, y_5, 0]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{2, 9}} order: 8

See Matrix

$$[y_2, y_1, y_5, y_4, y_3, 0, y_6, y_7, y_8]$$

70 . Coloring, {3, 6, 9}

$\Omega p(\Delta)=0$: $p = s - 5s^5 - 12s^7$ $p' = s + s^4 - 4s^6$ $p' = s^2 + 3s^4 + 4s^6$ $p' = s^3 + s^4 + 4s^6$ $p' = -s^4 + s^5 - 2s^6$

R: [4, 4, 5, 7, 7, 8, 1, 1, 2]
B: [2, 9, 4, 8, 3, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
2 *vs* 7	2 *vs* 9	3 *vs* 9	2 *vs* 6	3 *vs* 9

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, y_2, 0, y_1, y_2, 0, y_1, y_2, 0]$$

$p = -s^2 + s^3$ $p = -s^2 + s^4$ $p = -s^2 + s^5$ $p = -s^2 + s^6$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 4, 5, 6, 7, 8}} order: 6

See Matrix

$$[y_1, y_2, y_3, y_1, y_2, y_3, y_1, y_2, y_3]$$

$p' = -s^2 + s^5$ $p' = -1 + s^6$ $p' = -s^2 + s^8$ $p' = -s + s^7$ $p' = -1 + s^3$ $p' = -s + s^4$

See 3-level graph

M \; N

0	0	0	3	0	0	3	0	0	0	186	280	535	414	480	535	470	310
0	0	0	0	2	0	0	2	0	186	0	293	434	535	405	450	535	372
0	0	0	0	0	1	0	0	1	280	293	0	520	525	535	270	252	535
3	0	0	0	0	0	3	0	0	535	434	520	0	126	90	535	510	460
[0	2	0	0	0	0	0	2	0]	[414	535	525	126	0	180	530	535	365]
0	0	1	0	0	0	0	0	1	480	405	535	90	180	0	500	485	535
3	0	0	3	0	0	0	0	0	535	450	270	535	530	500	0	90	300
0	2	0	0	2	0	0	0	0	470	535	252	510	535	485	90	0	333
0	0	1	0	0	1	0	0	0	310	372	535	460	365	535	300	333	0

$\tau = 27$, $r' = 2/3$

R: [4, 4, 5, 7, 7, 8, 1, 1, 2]
B: [2, 9, 4, 8, 3, 7, 5, 6, 1]

Ranges

Action of R on ranges, [[1], [1], [2]]
Action of B on ranges, [[2], [3], [1]]

Cycles: R , {{1, 4, 7}}, B , {{1, 2, 9}, {3, 4, 5, 6, 7, 8}}

$\beta(\{1, 4, 7\}) = 1/2$
$\beta(\{2, 5, 8\}) = 1/3$
$\beta(\{3, 6, 9\}) = 1/6$

Partitions

Too many possibilities to consider

Sandwich	
Coloring	{3, 6, 9}
Rank	3
R,B	[4, 4, 5, 7, 7, 8, 1, 1, 2], [2, 9, 4, 8, 3, 7, 5, 6, 1]
π_2	[0, 0, 3, 0, 0, 3, 0, 0, 0, 0, 2, 0, 0, 2, 0, 0, 0, 1, 0, 0, 1, 0, 0, 3, 0, 0, 0, 0, 2, 0, 0, 0, 1, 0, 0, 0]
u_2	[186, 280, 535, 414, 480, 535, 470, 310, 293, 434, 535, 405, 450, 535, 372, 520, 525, 535, 270, 252, 535, 126, 90, 535, 510, 460, 180, 530, 535, 365, 500, 485, 535, 90, 300, 333] (dim 1)
wpp	[3, 3, 3, 3, 3, 3, 3, 3, 3]

π_3	[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
u_3	[323, 255, 195, 235, 303, 363, 0, 795, 447, 675, 45, 70, 165, 15, 105, 1605, 1335, 705, 110, 1227, 1047, 685, 1335, 1095, 765, 75, 225, 245, 531, 849, 489, 25, 30, 390, 75, 125, 1047, 1227, 646, 150, 1335, 1605, 606, 855, 1065, 726, 15, 470, 510, 343, 225, 765, 686, 1335, 510, 785, 726, 1065, 705, 606, 1605, 0, 105, 150, 0, 363, 303, 35, 165, 145, 45, 195, 675, 699, 430, 390, 30, 255, 375, 489, 215, 795, 849, 55]

71 . Coloring, {3, 7, 8}

$\Omega p(\Delta)=0$: $p = s^3 + s^4 - 8s^7$

R: [4, 4, 5, 7, 7, 7, 5, 6, 1]
B: [2, 9, 4, 8, 3, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	6 *vs* 6

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1, 0, 0, y_2, y_3, 2\,y_1, y_4, 0, 0]$$

$p = - s^3 + s^5$

Omega Rank for B : cycles: {{2, 9}} order: 6

See Matrix

$$[y_1, y_2, y_3, y_4, 0, 0, 0, y_5, y_6]$$

72 . Coloring, {3, 7, 9}

R: [4, 4, 5, 7, 7, 7, 5, 1, 2]
B: [2, 9, 4, 8, 3, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B

7 *vs* 7	8 *vs* 8	8 *vs* 8	3 *vs* 5	6 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[2\,y_3,\ y_3,\ 0,\ 3\,y_3 - y_1 + y_2,\ y_1,\ 0,\ y_2,\ 0,\ 0]$$

$p = -s^3 + s^4$ $p = -s^3 + s^5$

Omega Rank for B : cycles: {{6, 8}, {1, 2, 9}} order: 6

See Matrix

$$[y_3,\ y_4,\ y_3 + y_4 - y_1 - y_2 - y_6 + y_5,\ y_1,\ 0,\ y_2,\ 0,\ y_6,\ y_5]$$

$p = -s^3 - s^4 + s^6 + s^7$

73 . Coloring, {3, 8, 9}

R: [4, 4, 5, 7, 7, 7, 1, 6, 2]
B: [2, 9, 4, 8, 3, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	7 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1,\ y_3,\ 0,\ y_2,\ y_3,\ 2\,y_3,\ y_4,\ 0,\ 0]$$

$p' = s^2 - s^5$ $p = s^2 - s^5$

Omega Rank for B : cycles: {{1, 2, 9}} order: 6

See Matrix

$$[y_2,\ y_1,\ y_7,\ y_6,\ y_5,\ 0,\ 0,\ y_4,\ y_3]$$

74 . Coloring, {4, 5, 6}

Ωp(Δ)=0: $p = s^3 + s^4 - 8s^7$

R: [4, 4, 4, 8, 3, 8, 1, 1, 1]
B: [2, 9, 5, 7, 7, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 4	3 *vs* 5

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_2, 0, y_1, y_4, 0, 0, 0, y_3, 0]$$

Omega Rank for B : cycles: {{2, 9}, {5, 7}} order: 2

See Matrix

$$[0, y_2 - y_3, 0, 0, y_2 - y_1, y_1, y_2, 0, y_3]$$

$p = s^2 - s^4$ $p' = -s^2 + s^4$

75 . Coloring, {4, 5, 7}

R: [4, 4, 4, 8, 3, 7, 5, 1, 1]
B: [2, 9, 5, 7, 7, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}} order: 6

See Matrix

$$[y_6, 0, y_5, y_3, y_4, 0, y_1, y_2, 0]$$

Omega Rank for B : cycles: {{2, 9}, {6, 8}} order: 4

See Matrix

$$[y_2 + 4\,y_4 - y_1 - y_5, 4\,y_2 - y_3 + y_4, 0, 0, y_1, y_2, y_3, y_4, y_5]$$

$p = s^4 - s^6 \quad p' = -s^4 + s^6$

76 . Coloring, {4, 5, 8}

R: [4, 4, 4, 8, 3, 7, 1, 6, 1]
B: [2, 9, 5, 7, 7, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 6	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}} order: 5

See Matrix

$$[y_3, 0, y_2, y_1, 0, y_5, y_6, y_4, 0]$$

Omega Rank for B : cycles: {{5, 7}, {2, 9}} order: 4

See Matrix

$$[y_1 - y_4, y_2 - y_3, 0, 0, y_1, 0, y_2, y_3, y_4]$$

$p' = s^3 - s^5 \quad p = s^3 - s^5$

77 . Coloring, {4, 5, 9}

R: [4, 4, 4, 8, 3, 7, 1, 1, 2]
B: [2, 9, 5, 7, 7, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	4 *vs* 6	4 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_1, y_2, 2\,y_2, y_3, 0, 0, y_2, y_4, 0]$$

$p = -s^2 + s^5 \quad p' = -s^2 + s^5$

Omega Rank for B : cycles: {{5, 7}, {1, 2, 9}, {6, 8}} order: 6

See Matrix

$$[y_1, -y_1 + 2\,y_2 - 2\,y_3 - y_4, 0, 0, y_2, y_2 - 2\,y_3, 2\,y_2 - 3\,y_3, y_3, y_4]$$

$p = -s + s^7$ $p' = s + s^2 - s^4 - s^5$ $p = -s - s^2 + s^4 + s^5$

78 . Coloring, {4, 6, 7}

R: [4, 4, 4, 8, 7, 8, 5, 1, 1]
B: [2, 9, 5, 7, 3, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {1, 4, 8}} order: 6

See Matrix

$$[-5\,y_1 + 13\,y_2 + 13\,y_3 - 5\,y_4, 0, 0, 5\,y_1, 5\,y_2, 0, 5\,y_3, 5\,y_4, 0]$$

$p = -s - s^2 + s^4 + s^5$

Omega Rank for B : cycles: {{2, 9}, {3, 5}} order: 4

See Matrix

$$[2\,y_5 + 3\,y_3 - y_2 - y_1, y_4, y_5, 0, y_3, y_2, -y_4 + 3\,y_5 + 2\,y_3, 0, y_1]$$

$p = -s^4 + s^6$ $p' = -s^4 + s^6$

79 . Coloring, {4, 6, 8}

$\Omega p(\Delta)=0$: $p = s^2 - 2s^4 + 8s^5 - 16s^7$

R: [4, 4, 4, 8, 7, 8, 1, 6, 1]
B: [2, 9, 5, 7, 3, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 5	3 *vs* 6

Omega Rank for R : cycles: {{6, 8}} order: 4

See Matrix

$$[y_1, 0, 0, y_2, 0, y_5, y_4, y_3, 0]$$

Omega Rank for B : cycles: {{2, 9}, {3, 5}} order: 2

See Matrix

$$[-5\,y_3 + 2\,y_1 + 2\,y_2, -4\,y_3 + 2\,y_1 + 2\,y_2, y_1, 0, y_2, 0, -10\,y_3 + 4\,y_1 + 4\,y_2, 0, y_3]$$

$p = s^2 - s^4$ $p' = -s^2 + s^4$ $p' = -s^3 + s^5$

80 . Coloring, {4, 6, 9}

R: [4, 4, 4, 8, 7, 8, 1, 1, 2]
B: [2, 9, 5, 7, 3, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	2 *vs* 5	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_1, y_1 - y_2, 0, 2\,y_1 - y_2, 0, 0, 2\,y_1 - 2\,y_2, y_2, 0]$$

$p = s^2 - s^3$ $p' = -s^2 + s^4$ $p' = -s^2 + s^3$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 5}} order: 6

See Matrix

$$[y_5, y_4, y_3, 0, y_2, y_1, -y_3 + y_2 + y_1, 0, -y_5 - y_4 + y_2 + y_1]$$

$p = s^3 - s^6$ $p' = s^3 - s^6$

81 . Coloring, {4, 7, 8}

R: [4, 4, 4, 8, 7, 7, 5, 6, 1]
B: [2, 9, 5, 7, 3, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 6	4 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 6

See Matrix

$$[y_4, 0, 0, y_5, y_1, y_6, y_2, y_3, 0]$$

Omega Rank for B : cycles: {{2, 9}, {3, 5}} order: 4

See Matrix

$$[2\,y_1 + 3\,y_2 - y_4, 3\,y_1 + 2\,y_2 - 4\,y_3, y_1, 0, y_2, 0, 3\,y_3, y_3, y_4]$$

$p' = -s^4 + s^6$ $p' = s^3 - s^5$ $p = s^3 - s^5$

82 . Coloring, {4, 7, 9}

R: [4, 4, 4, 8, 7, 7, 5, 1, 2]
B: [2, 9, 5, 7, 3, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 8	8 *vs* 8	4 *vs* 6	5 *vs* 8

Omega Rank for R : cycles: {{1, 4, 8}, {5, 7}} order: 6

See Matrix

$$[-y_2 - y_1 + 4\,y_3 - y_4, y_2, 0, y_1, y_3, 0, y_3, y_4, 0]$$

$p' = -s^2 + s^5$ $p = -s^2 + s^5$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 5}, {6, 8}} order: 6

See Matrix

$$[-y_1 + 4\,y_5 - y_4 + 4\,y_3 - y_2, y_1, y_5, 0, y_3, y_5, y_4, y_3, y_2]$$

$p = -s^2 + s^8$ $p = -s^2 - s^3 + s^5 + s^6$ $p' = s^2 + s^3 - s^5 - s^6$

83 . Coloring, {4, 8, 9}

R: [4, 4, 4, 8, 7, 7, 1, 6, 2]
B: [2, 9, 5, 7, 3, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 6	3 *vs* 7

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}} order: 5

See Matrix

$$[y_1, y_2, 0, y_3, 0, y_4, y_5, y_6, 0]$$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 5}} order: 6

See Matrix

$$[y_2 + y_3, y_2 + y_3, 3\,y_3 - y_1, 0, y_1, 0, 3\,y_2, y_2, y_3]$$

$p = -s^2 + s^4$ $p' = -s^2 + s^4$ $p = -s^2 + s^6$ $p' = -s^2 + s^6$

84 . Coloring, {5, 6, 7}

R: [4, 4, 4, 7, 3, 8, 5, 1, 1]
B: [2, 9, 5, 8, 7, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 6	6 *vs* 7

Omega Rank for R : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_2, 0, y_3, y_1, y_6, 0, y_4, y_5, 0]$$

Omega Rank for B : cycles: {{2, 9}} order: 6

See Matrix

$$[y_2, y_1, 0, 0, y_4, y_3, y_5, 3\,y_4, y_6]$$

$p = s^5 - s^7$

85 . Coloring, {5, 6, 8}

R: [4, 4, 4, 7, 3, 8, 1, 6, 1]
B: [2, 9, 5, 8, 7, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}, {6, 8}} order: 6

See Matrix

$$[y_1, 0, y_3, -y_1 - y_3 + 5\,y_2 - y_5 + 5\,y_4, 0, y_2, y_5, y_4, 0]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{5, 7}, {2, 9}} order: 4

See Matrix

$$[5\,y_1, -16\,y_1 + 33\,y_3 - 5\,y_4 - 16\,y_2, 0, 0, -7\,y_1 + 16\,y_3 - 7\,y_2, 0, 5\,y_3, 5\,y_4, 5\,y_2]$$

$p = s^3 - s^5$ $p' = s^3 - s^5$

86 . Coloring, {5, 6, 9}

R: [4, 4, 4, 7, 3, 8, 1, 1, 2]
B: [2, 9, 5, 8, 7, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	4 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1, y_3, 2\,y_3, y_4, 0, 0, y_2, y_3, 0]$$

$p' = -s^2 + s^5$ $p = -s^2 + s^5$

Omega Rank for B : cycles: {{1, 2, 9}, {5, 7}} order: 6

See Matrix

$$[y_1, -y_1 + y_5 + y_4 - y_3, 0, 0, -y_2 + y_5 + y_4, y_2, y_5, y_4, y_3]$$

$p = -s^3 + s^6$ $p' = -s^3 + s^6$

87 . Coloring, {5, 7, 8}

R: [4, 4, 4, 7, 3, 7, 5, 6, 1]
B: [2, 9, 5, 8, 7, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_4, 0, y_3, y_1, y_2, 2\,y_4, y_5, 0, 0]$$

$p = -s^2 + s^6$

Omega Rank for B : cycles: {{2, 9}} order: 4

See Matrix

$$[y_1, y_2, 0, 0, y_3, 0, y_4, 4\,y_3, y_5]$$

$p = -s^4 + s^6$

88 . Coloring, {5, 7, 9}

R: [4, 4, 4, 7, 3, 7, 5, 1, 2]
B: [2, 9, 5, 8, 7, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 6	4 *vs* 7

Omega Rank for R : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[2\,y_1,\ y_1,\ y_2,\ 3\,y_1 + y_2 - y_3 + y_4,\ y_3,\ 0,\ y_4,\ 0,\ 0]$$

$p' = -s^2 + s^3 - s^4 + s^5 \quad p = s^2 - s^6$

Omega Rank for B : cycles: {{6, 8}, {1, 2, 9}} order: 6

See Matrix

$$[2\,y_3 + 2\,y_2,\ 2\,y_3 + 2\,y_2 - 2\,y_1,\ 0,\ 0,\ 2\,y_1,\ 2\,y_4,\ 2\,y_3,\ 3\,y_3 + 3\,y_2 - 2\,y_4,\ 2\,y_2]$$

$p = -s^3 + s^5 \quad p' = -s^3 + s^5 \quad p = -s^3 + s^7$

89 . Coloring, {5, 8, 9}

R: [4, 4, 4, 7, 3, 7, 1, 6, 2]
B: [2, 9, 5, 8, 7, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}} order: 3

See Matrix

$$[y_1,\ y_2,\ 2\,y_2,\ y_4,\ 0,\ 2\,y_2,\ y_3,\ 0,\ 0]$$

$p' = -s^2 + s^5 \quad p = -s^2 + s^5$

Omega Rank for B : cycles: {{5, 7}, {1, 2, 9}} order: 6

See Matrix

$$[-y_1 + 2\,y_2 + 2\,y_3 - y_4 - y_5,\ y_1,\ 0,\ 0,\ y_2,\ 0,\ y_3,\ y_4,\ y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$

90 . Coloring, {6, 7, 8}

R: [4, 4, 4, 7, 7, 8, 5, 6, 1]
B: [2, 9, 5, 8, 3, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	4 *vs* 6	4 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[-15\,y_2 - y_1 + 4\,y_4 + 4\,y_3, 0, 0, y_4, y_3, y_2, y_1, y_4 + y_3 - 4\,y_2, 0]$$

$p' = -s^3 + s^5$ $p = s^3 - s^5$

Omega Rank for B : cycles: {{2, 9}, {3, 5}} order: 4

See Matrix

$$[2\,y_1 + 3\,y_2 - y_3, 3\,y_1 + 2\,y_2 - 4\,y_4, y_1, 0, y_2, 0, y_4, 3\,y_4, y_3]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$ $p = -s^3 + s^7$

91 . Coloring, {6, 7, 9}

R: [4, 4, 4, 7, 7, 8, 5, 1, 2]
B: [2, 9, 5, 8, 3, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 8	8 *vs* 8	5 *vs* 6	7 *vs* 8

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1, y_4, 0, y_3, y_2, 0, y_5, y_4, 0]$$

$p = s^4 - s^6$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 9}} order: 6

See Matrix

$$[y_3, -y_3 + 5\,y_2 + 5\,y_1 - y_7 - y_5 - y_6 - y_4, y_2, 0, y_1, y_7, y_5, y_6, y_4]$$

$p = -s^4 - s^5 + s^7 + s^8$

92 . Coloring, {6, 8, 9}

R: [4, 4, 4, 7, 7, 8, 1, 6, 2]
B: [2, 9, 5, 8, 3, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}, {6, 8}} order: 6

See Matrix

$$[y_3, -y_3 - y_1 + 5\,y_2 - y_5 + 5\,y_4, 0, y_1, 0, y_2, y_5, y_4, 0]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 9}} order: 6

See Matrix

$$[-7\,y_1 + 11\,y_2 + 11\,y_3 - 10\,y_4 - 7\,y_5, 7\,y_1, 7\,y_2, 0, 7\,y_3, 0, 7\,y_4, 21\,y_4, 7\,y_5]$$

$p' = s^2 + s^3 - s^5 - s^6$ $p = -s^2 - s^3 + s^5 + s^6$

93 . Coloring, {7, 8, 9}

R: [4, 4, 4, 7, 7, 7, 5, 6, 2]
B: [2, 9, 5, 8, 3, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	5 *vs* 6

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[0, y_4, 0, y_2, y_3, 2\,y_4, y_1, 0, 0]$$

$p = -s^3 + s^5$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 9}} order: 6

See Matrix

$$[-y_1 + 5\,y_2 + 5\,y_3 - y_5 - y_4, y_1, y_2, 0, y_3, 0, 0, y_5, y_4]$$

$p = -s^2 - s^3 + s^5 + s^6$

94 . Coloring, {2, 3, 4, 5}

R: [4, 9, 5, 8, 3, 7, 1, 1, 1]
B: [2, 4, 4, 7, 7, 8, 5, 6, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{3, 5}, {1, 4, 8}} order: 6

See Matrix

$$[y_3, 0, y_2, -y_3 + 5\,y_2 + 5\,y_1 - 3\,y_4 - y_5, y_1, 0, y_4, y_5, 2\,y_4]$$

$p' = s^2 + s^3 - s^5 - s^6$ $p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[0, y_4, 0, y_3, -y_3 - 15\,y_1 + 4\,y_4 + 4\,y_2, y_1, y_2, y_4 - 4\,y_1 + y_2, 0]$$

$p = s^3 - s^5$ $p' = s^3 - s^5$

95 . Coloring, {2, 3, 4, 6}

R: [4, 9, 5, 8, 7, 8, 1, 1, 1]
B: [2, 4, 4, 7, 3, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_1, 0, 0, y_5, y_4, 0, y_2, y_3, 2\, y_4]$$

$p = s^3 - s^6$

Omega Rank for B : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[0, 2\, y_5, y_2, y_1, y_4, y_5, y_3, 0, 0]$$

$p = s^2 - s^6$

96 . Coloring, {2, 3, 4, 7}

R: [4, 9, 5, 8, 7, 7, 5, 1, 1]
B: [2, 4, 4, 7, 3, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {1, 4, 8}} order: 6

See Matrix

$$[-7\, y_3 + 11\, y_4 + 11\, y_1 - 7\, y_5 - 7\, y_2, 0, 0, 7\, y_3, 7\, y_4, 0, 7\, y_1, 7\, y_5, 7\, y_2]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}, {6, 8}} order: 4

See Matrix

$$[-y_5 + y_2 + 4\,y_1, y_3, y_4, y_5, 0, y_2, -y_3 - y_4 + 4\,y_2 + y_1, y_1, 0]$$

$p = s^2 - s^6$ $p' = s^2 - s^6$

97 . Coloring, {2, 3, 4, 8}

R: [4, 9, 5, 8, 7, 7, 1, 6, 1]
B: [2, 4, 4, 7, 3, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 7	7 *vs* 7

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}} order: 5

See Matrix

$$[y_1, 0, 0, y_6, y_5, y_3, y_4, y_2, 2\,y_5]$$

$p = -s^2 + s^7$

Omega Rank for B : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_1, y_2, y_3, y_4, y_5, 0, y_6, y_7, 0]$$

98 . Coloring, {2, 3, 4, 9}

R: [4, 9, 5, 8, 7, 7, 1, 1, 2]
B: [2, 4, 4, 7, 3, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 7	6 *vs* 8

Omega Rank for R : cycles: {{1, 4, 8}, {2, 9}} order: 6

See Matrix

$$[5\,y_4 - y_2 - y_3 - y_5 - y_1 + 5\,y_6, y_4, 0, y_2, y_3, 0, y_5, y_1, y_6]$$

$p = -s^3 - s^4 + s^6 + s^7$

Omega Rank for B : cycles: {{3, 4, 5, 7}, {6, 8}} order: 4

See Matrix

$$[y_6, y_5, y_3, y_4, -y_6 - y_4 + 2\,y_2 + 3\,y_1, y_2, -y_5 - y_3 + 3\,y_2 + 2\,y_1, y_1, 0]$$

$p' = -s^3 + s^7$ $p = -s^3 + s^7$

99 . Coloring, {2, 3, 5, 6}

R: [4, 9, 5, 7, 3, 8, 1, 1, 1]
B: [2, 4, 4, 8, 7, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	6 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}, {3, 5}} order: 6

See Matrix

$$[5\,y_1 - y_2 + 5\,y_3 - y_4 - 3\,y_5, 0, y_1, y_2, y_3, 0, y_4, y_5, 2\,y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{5, 7}} order: 6

See Matrix

$$[0, y_6, 0, y_5, y_4, y_3, y_2, y_1, 0]$$

100 . Coloring, {2, 3, 5, 7}

$\Omega p(\Delta)=0$: $p = s^3 + 3s^4 + 8s^7$

R: [4, 9, 5, 7, 3, 7, 5, 1, 1]
B: [2, 4, 4, 8, 7, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	6 *vs* 6

Omega Rank for R : cycles: {{3, 5}} order: 6

See Matrix

$$[y_4, 0, y_1, y_2, y_3, 0, -y_4 - y_1 + y_2 + y_3 + y_5, 0, y_5]$$

$p = -s^5 + s^6$

Omega Rank for B : cycles: {{6, 8}} order: 6

See Matrix

$$[y_1, y_2, 0, y_4, 0, y_3, y_5, y_6, 0]$$

101 . Coloring, {2, 3, 5, 8}

R: [4, 9, 5, 7, 3, 7, 1, 6, 1]
B: [2, 4, 4, 8, 7, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}, {3, 5}} order: 6

See Matrix

$$[5 y_1 - y_2 + 5 y_3 - y_4 - 2 y_5, 0, y_1, y_2, y_3, y_5, y_4, 0, y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {5, 7}} order: 4

See Matrix

$$[-14 y_1 - y_3 + 39 y_4 - 14 y_2, y_1, 0, y_3, y_4, 0, -5 y_1 + 14 y_4 - 5 y_2, y_2, 0]$$

$p' = -s + s^5$ $p = -s + s^5$

102 . Coloring, {2, 3, 5, 9}

$\Omega p(\Delta)=0$: $p = s^2 - 8s^4 - 12s^5 + 8s^6 + 16s^7$

R: [4, 9, 5, 7, 3, 7, 1, 1, 2]
B: [2, 4, 4, 8, 7, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}, {3, 5}, {2, 9}} order: 6

See Matrix

$$[y_1, y_2, y_3, -y_1 + 4 y_3 + 4 y_2 - y_4, y_2, 0, y_4, 0, y_3]$$

$p = - s - s^2 + s^4 + s^5$ $p = - s + s^7$ $p = s - s^3 - s^4 + s^6$

Omega Rank for B : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[9 y_1 - 4 y_2 - 13 y_4 - 4 y_5 + 9 y_3, 4 y_1, 0, 4 y_2, 4 y_4, 4 y_5, 5 y_1 - 9 y_4 + 5 y_3, 4 y_3, 0]$$

$p' = - s^4 + s^6$ $p = - s^4 + s^6$

103 . Coloring, {2, 3, 6, 7}

R: [4, 9, 5, 7, 7, 8, 5, 1, 1]
B: [2, 4, 4, 8, 3, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	7 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_3, 0, 0, y_1, y_2, 0, y_4, y_5, 2 y_5]$$

$p = s^4 - s^6$

Omega Rank for B : cycles: {{1, 2, 4, 6, 7, 8}} order: 6

See Matrix

$$[y_4, y_3, y_2, y_1, 0, y_7, y_6, y_5, 0]$$

104 . Coloring, {2, 3, 6, 8}

R: [4, 9, 5, 7, 7, 8, 1, 6, 1]
B: [2, 4, 4, 8, 3, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	7 *vs* 7

Omega Rank for R : cycles: {{6, 8}, {1, 4, 7}} order: 6

See Matrix

$$[y_5, 0, 0, y_2, y_3, y_4, -y_5 - y_2 - 3\,y_3 + 5\,y_4 + 5\,y_1, y_1, 2\,y_3]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_4, y_1, y_2, y_3, y_6, 0, y_7, y_5, 0]$$

105 . Coloring, {2, 3, 6, 9}

R: [4, 9, 5, 7, 7, 8, 1, 1, 2]
B: [2, 4, 4, 8, 3, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 9	9 *vs* 9	5 *vs* 7	7 *vs* 8

Omega Rank for R : cycles: {{2, 9}, {1, 4, 7}} order: 6

See Matrix

$$[y_5, y_4, 0, y_3, y_2, 0, -y_5 + 5\,y_4 - y_3 - 2\,y_2 + 5\,y_1, y_2, y_1]$$

$p' = s^2 + s^3 - s^5 - s^6 \quad p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{3, 4, 5, 6, 7, 8}} order: 6

See Matrix

$$[y_1 + y_2 - y_3 - y_4 - y_7 + y_6 + y_5, y_1, y_2, y_3, y_4, y_7, y_6, y_5, 0]$$

$p = s^3 - s^4 + s^5 - s^6 + s^7 - s^8$

106 . Coloring, {2, 3, 7, 8}

$\Omega p(\Delta)=0: \quad p = s^2 + 2s^4 + 8s^5 + 16s^7$

R: [4, 9, 5, 7, 7, 7, 5, 6, 1]
B: [2, 4, 4, 8, 3, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	5 *vs* 5

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1, 0, 0, y_5, y_4, y_3, y_2, 0, y_3]$$

$p = -s^4 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1, y_2, y_3, y_4, 0, 0, 0, y_5, 0]$$

107 . Coloring, {2, 3, 7, 9}

R: [4, 9, 5, 7, 7, 7, 5, 1, 2]
B: [2, 4, 4, 8, 3, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	4 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {2, 9}} order: 4

See Matrix

$$[2\,y_1 - y_2 + 3\,y_3,\ y_1,\ 0,\ 3\,y_1 - y_4 + 2\,y_3,\ y_4,\ 0,\ y_2,\ 0,\ y_3]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$

Omega Rank for B : cycles: {{6, 8}} order: 4

See Matrix

$$[2\,y_1,\ y_1 + y_2 + y_3 - y_4,\ y_1,\ y_2,\ 0,\ y_3,\ 0,\ y_4,\ 0]$$

$p = -s^4 + s^5$ $p = -s^4 + s^6$

108 . Coloring, {2, 3, 8, 9}

R: [4, 9, 5, 7, 7, 7, 1, 6, 2]
B: [2, 4, 4, 8, 3, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}, {2, 9}} order: 6

See Matrix

$$[5\,y_1 - y_2 - 3\,y_3 - y_5 + 5\,y_4,\ y_1,\ 0,\ y_2,\ y_3,\ 2\,y_3,\ y_5,\ 0,\ y_4]$$

$p' = s^2 + s^3 - s^5 - s^6$ $p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_4,\ y_2,\ y_3,\ -y_4 + y_2 + y_3 - y_1 + y_5,\ y_1,\ 0,\ 0,\ y_5,\ 0]$$

$p = -s^3 + s^4 - s^5 + s^6$

109 . Coloring, {2, 4, 5, 6}

$\Omega p(\Delta)=0$: $p = s^2 + 2s^4 + 8s^5 + 16s^7$

R: [4, 9, 4, 8, 3, 8, 1, 1, 1]
B: [2, 4, 5, 7, 7, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	4 *vs* 5

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$[y_1, 0, y_4, y_2, 0, 0, 0, y_3, y_4]$

$p = s^2 - s^5$

Omega Rank for B : cycles: {{5, 7}} order: 4

See Matrix

$[0, 2\,y_2, 0, y_3, y_4, y_2, y_1, 0, 0]$

$p = s^3 - s^5$

110 . Coloring, {2, 4, 5, 7}

R: [4, 9, 4, 8, 3, 7, 5, 1, 1]
B: [2, 4, 5, 7, 7, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}} order: 6

See Matrix

$[y_2, 0, y_1, y_6, y_5, 0, y_4, y_3, 2\,y_4]$

$p = -s^4 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 7}, {6, 8}} order: 4

See Matrix

$$[y_3 + 4\,y_5 - y_1 - y_2,\ 4\,y_3 - y_4 + y_5,\ 0,\ y_1,\ y_2,\ y_3,\ y_4,\ y_5,\ 0]$$

$p = -s^2 + s^6$ $p' = -s^2 + s^6$

111 . Coloring, {2, 4, 5, 8}

R: [4, 9, 4, 8, 3, 7, 1, 6, 1]
B: [2, 4, 5, 7, 7, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 7	6 *vs* 6

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}} order: 5

See Matrix

$$[y_1,\ 0,\ y_5,\ y_2,\ 0,\ y_3,\ y_6,\ y_4,\ y_5]$$

$p = -s^2 + s^7$

Omega Rank for B : cycles: {{5, 7}} order: 6

See Matrix

$$[y_2,\ y_1,\ 0,\ y_4,\ y_3,\ 0,\ y_5,\ y_6,\ 0]$$

112 . Coloring, {2, 4, 5, 9}

$\Omega p(\Delta)=0$: $p = s^2 - 4s^5 - 8s^6 + 16s^7$

R: [4, 9, 4, 8, 3, 7, 1, 1, 2]
B: [2, 4, 5, 7, 7, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {1, 4, 8}} order: 6

See Matrix

$$[5\,y_1 - y_2 - 3\,y_3 - y_4 + 5\,y_5, y_1, 2\,y_3, y_2, 0, 0, y_3, y_4, y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{6, 8}, {5, 7}} order: 4

See Matrix

$$[-y_1 - y_2 + 2\,y_5 + 3\,y_4, 3\,y_5 - y_3 + 2\,y_4, 0, y_1, y_2, y_5, y_3, y_4, 0]$$

$p = -s^4 + s^6$ $p' = -s^4 + s^6$

113 . Coloring, {2, 4, 6, 7}

R: [4, 9, 4, 8, 7, 8, 5, 1, 1]
B: [2, 4, 5, 7, 3, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}, {5, 7}} order: 6

See Matrix

$$[-5\,y_1 + 13\,y_2 + 13\,y_3 - 5\,y_4 - 5\,y_5, 0, 0, 5\,y_1, 5\,y_2, 0, 5\,y_3, 5\,y_4, 5\,y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}, {3, 5}} order: 4

See Matrix

$$[y_5, y_4, y_3, y_2, y_1, -y_5 + 2\,y_3 - y_2 + 3\,y_1, -y_4 + 3\,y_3 + 2\,y_1, 0, 0]$$

$p = -s^2 + s^6$ $p' = -s^2 + s^6$

114 . Coloring, {2, 4, 6, 8}

$\Omega p(\Delta)=0$: $p = s^3 + 3s^4 + 8s^7$

R: [4, 9, 4, 8, 7, 8, 1, 6, 1]
B: [2, 4, 5, 7, 3, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	6 *vs* 6

Omega Rank for R : cycles: {{6, 8}} order: 4

See Matrix

$[y_1, 0, 0, y_2, 0, y_3, y_5, y_4, y_5]$

$p = -s^4 + s^6$

Omega Rank for B : cycles: {{3, 5}} order: 6

See Matrix

$[y_1, y_2, y_3, y_4, y_5, 0, y_6, 0, 0]$

115 . Coloring, {2, 4, 6, 9}

R: [4, 9, 4, 8, 7, 8, 1, 1, 2]
B: [2, 4, 5, 7, 3, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}, {2, 9}} order: 6

See Matrix

$[5\,y_1 - y_2 - y_3 - y_5 + 5\,y_4, y_1, 0, y_2, 0, 0, y_3, y_5, y_4]$

$p = s^2 + s^3 - s^5 - s^6$

Omega Rank for B : cycles: {{3, 5}} order: 6

See Matrix

$$[y_3, y_2, y_1, -3\,y_3 + y_2 + y_1 - y_5 + y_4, y_5, 2\,y_3, y_4, 0, 0]$$

$p' = s^5 - s^6$ $p = s^5 - s^7$

116 . Coloring, {2, 4, 7, 8}

R: [4, 9, 4, 8, 7, 7, 5, 6, 1]
B: [2, 4, 5, 7, 3, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	7 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 6

See Matrix

$$[y_3, 0, 0, y_1, y_2, y_6, y_7, y_4, y_5]$$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 4, 7}} order: 4

See Matrix

$$[2\,y_1 - y_4 + 3\,y_3, y_5, y_1, y_4, y_3, 0, y_2, -y_5 + 3\,y_1 + 2\,y_3 - y_2, 0]$$

$p = -s^2 + s^6$ $p' = -s^2 + s^6$

117 . Coloring, {2, 4, 7, 9}

$\Omega p(\Delta)=0$: $p = s - 8s^3 - 12s^4 + 32s^6 + 32s^7$

R: [4, 9, 4, 8, 7, 7, 5, 1, 2]
B: [2, 4, 5, 7, 3, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 8	7 *vs* 8	4 *vs* 7	4 *vs* 8

Omega Rank for R : cycles: {{5, 7}, {2, 9}, {1, 4, 8}} order: 6

See Matrix

$$[y_1, y_2 - y_3, 0, -y_1 + 3\,y_2 - y_4, y_2, 0, y_2, y_4, y_3]$$

$p = -s - s^2 + s^4 + s^5$ $p = -s + s^7$ $p = s - s^3 - s^4 + s^6$

Omega Rank for B : cycles: {{3, 5}, {6, 8}, {1, 2, 4, 7}} order: 4

See Matrix

$$[y_2, 2\,y_1 - y_3 + 2\,y_4, y_1, -y_2 + 2\,y_1 + 2\,y_4, y_4, y_1, y_3, y_4, 0]$$

$p' = -s^2 + s^6$ $p' = -s^3 + s^7$ $p = -s + s^5$ $p' = -s + s^5$

M \; N

0	142	0	0	104	87	191	0	46	0	1	0	0	1	1	1	0	1
142	0	52	94	0	0	0	92	0	1	0	1	1	0	0	0	1	0
0	52	0	0	0	57	81	0	0	0	1	0	0	1	1	1	0	1
0	94	0	0	162	46	171	0	97	0	1	0	0	1	1	1	0	1
[104	0	0	162	0	0	0	114	0]	[1	0	1	1	0	0	0	1	0]
87	0	57	46	0	0	0	0	0	1	0	1	1	0	0	0	1	0
191	0	81	171	0	0	0	127	0	1	0	1	1	0	0	0	1	0
0	92	0	0	114	0	127	0	47	0	1	0	0	1	1	1	0	1
46	0	0	97	0	0	0	47	0	1	0	1	1	0	0	0	1	0

$\tau = 41$, $r' = 1/2$

R: [4, 9, 4, 8, 7, 7, 5, 1, 2]
B: [2, 4, 5, 7, 3, 8, 1, 6, 1]

Ranges

Action of R on ranges, [[14], [13], [13], [11], [7], [14], [17], [5], [13], [11], [16], [16], [15], [8], [4], [2], [1]]
Action of B on ranges, [[7], [6], [8], [1], [1], [11], [13], [12], [15], [2], [10], [16], [4], [4], [9], [3], [3]]

Cycles: R , {{5, 7}, {2, 9}, {1, 4, 8}}, B , {{3, 5}, {6, 8}, {1, 2, 4, 7}}

β({1, 2}) = 71/855
β({1, 5}) = 52/855
β({1, 6}) = 29/570
β({1, 7}) = 191/1710
β({1, 9}) = 23/855
β({2, 3}) = 26/855
β({2, 4}) = 47/855
β({2, 8}) = 46/855
β({3, 6}) = 1/30
β({3, 7}) = 9/190
β({4, 5}) = 9/95
β({4, 6}) = 23/855

β({4, 7}) = 1/10
β({4, 9}) = 97/1710
β({5, 8}) = 1/15
β({7, 8}) = 127/1710
β({8, 9}) = 47/1710

Partitions
α([{1, 3, 4, 8}, {2, 5, 6, 7, 9}]) = 1/1

b1 = {1, 3, 4, 8} , b2 = {2, 5, 6, 7, 9}

Action of R and B on the blocks of the partitions: = [1, 2] [2, 1]
with invariant measure [1, 1]

N by blocks, check: true . See partition graph.

See level-2 partition graph.

Right Group	
Coloring	{2, 4, 7, 9}
Rank	2
R,B	[4, 9, 4, 8, 7, 7, 5, 1, 2], [2, 4, 5, 7, 3, 8, 1, 6, 1]
π_2	[142, 0, 0, 104, 87, 191, 0, 46, 52, 94, 0, 0, 0, 92, 0, 0, 0, 57, 81, 0, 0, 162, 46, 171, 0, 97, 0, 0, 114, 0, 0, 0, 0, 127, 0, 47]
u_2	[1, 0, 0, 1, 1, 1, 0, 1, 1, 1, 0, 0, 0, 1, 0, 0, 1, 1, 1, 0, 1, 1, 1, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 1, 0, 1] (dim 1)
wpp	[4, 5, 4, 4, 5, 5, 5, 4, 5]

118 . Coloring, {2, 4, 8, 9}

R: [4, 9, 4, 8, 7, 7, 1, 6, 2]
B: [2, 4, 5, 7, 3, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 7	6 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {1, 4, 6, 7, 8}}

See Matrix

$$[y_6, y_5, 0, y_4, 0, y_3, y_2, -y_6 + 5\, y_5 - y_4 - y_3 - y_2 + 5\, y_1, y_1]$$

$p = -s - s^2 + s^6 + s^7$

Omega Rank for B : cycles: {{3, 5}} order: 6

See Matrix

$$[y_2, y_1, y_2 - y_1 + y_5 + y_4 - y_3 - y_6, y_5, y_4, 0, y_3, y_6, 0]$$

$p = s^6 - s^7$

119 . Coloring, {2, 5, 6, 7}

R: [4, 9, 4, 7, 3, 8, 5, 1, 1]
B: [2, 4, 5, 8, 7, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 7	7 *vs* 7

Omega Rank for R : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_5, 0, y_4, y_3, y_2, 0, y_1, y_6, 2\,y_6]$$

$p = s^3 - s^7$

Omega Rank for B : cycles: {{1, 2, 4, 6, 7, 8}} order: 6

See Matrix

$$[y_1, y_2, 0, y_3, y_7, y_4, y_5, y_6, 0]$$

120 . Coloring, {2, 5, 6, 8}

R: [4, 9, 4, 7, 3, 8, 1, 6, 1]
B: [2, 4, 5, 8, 7, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}, {6, 8}} order: 6

See Matrix

$$[-2\,y_3 - y_1 + 5\,y_5 - y_4 + 5\,y_2,\ 0,\ y_3,\ y_1,\ 0,\ y_5,\ y_4,\ y_2,\ y_3]$$

$p = s^2 - s^4 - s^5 + s^7$ $p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {5, 7}} order: 4

See Matrix

$$[-16\,y_4 - 5\,y_3 + 33\,y_2 - 16\,y_1,\ 5\,y_4,\ 0,\ 5\,y_3,\ 5\,y_2,\ 0,\ -7\,y_4 + 16\,y_2 - 7\,y_1,\ 5\,y_1,\ 0]$$

$p' = -s + s^5$ $p = -s + s^5$

121 . Coloring, {2, 5, 6, 9}

R: [4, 9, 4, 7, 3, 8, 1, 1, 2]
B: [2, 4, 5, 8, 7, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	6 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {1, 4, 7}} order: 6

See Matrix

$$[5\,y_1 - y_2 - y_3 - 3\,y_4 + 5\,y_5,\ y_1,\ 2\,y_4,\ y_2,\ 0,\ 0,\ y_3,\ y_4,\ y_5]$$

$p = -s^2 + s^4 + s^5 - s^7$ $p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{5, 7}} order: 6

See Matrix

$$[y_6,\ y_5,\ 0,\ y_4,\ y_3,\ y_2,\ y_1,\ y_6 - y_5 + y_4 + y_3 + y_2 - y_1,\ 0]$$

$p = s^6 - s^7$

122 . Coloring, {2, 5, 7, 8}

Ωp(Δ)=0: $p = s^3 - 16s^5 + 8s^6 - 32s^7$ $p' = s^3 + 4s^4 + 8s^6$

R: [4, 9, 4, 7, 3, 7, 5, 6, 1]
B: [2, 4, 5, 8, 7, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
5 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 7	6 *vs* 6

Omega Rank for R : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_1, 0, y_2, y_3, y_6, y_5, y_4, 0, y_5]$$

$p = -s^3 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1, y_2, 0, y_3, y_4, 0, y_5, y_6, 0]$$

123 . Coloring, {2, 5, 7, 9}

R: [4, 9, 4, 7, 3, 7, 5, 1, 2]
B: [2, 4, 5, 8, 7, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 7	6 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {3, 4, 5, 7}} order: 4

See Matrix

$$[2\,y_1 - y_2 - y_4 + 3\,y_5, y_1, y_2, 3\,y_1 - y_3 + 2\,y_5, y_3, 0, y_4, 0, y_5]$$

$p = -s^2 + s^6$ $p' = -s^2 + s^6$

Omega Rank for B : cycles: {{6, 8}} order: 6

See Matrix

$$[y_4 - y_1 - y_2 - y_3 + y_6 + y_5, y_4, 0, y_1, y_2, y_3, y_6, y_5, 0]$$

$p = -s^6 + s^7$

124 . Coloring, {2, 5, 8, 9}

R: [4, 9, 4, 7, 3, 7, 1, 6, 2]
B: [2, 4, 5, 8, 7, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 7}, {2, 9}} order: 6

See Matrix

$$[y_5, y_1, y_2, -y_5 + 5\,y_1 - 2\,y_2 - y_3 + 5\,y_4, 0, y_2, y_3, 0, y_4]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {5, 7}} order: 4

See Matrix

$$[3\,y_1 - y_2 - 4\,y_3 + 3\,y_4, y_1, 0, y_2, y_3, 0, 2\,y_1 - 3\,y_3 + 2\,y_4, y_4, 0]$$

$p = -s + s^5$ $p' = -s + s^5$

125 . Coloring, {2, 6, 7, 8}

R: [4, 9, 4, 7, 7, 8, 5, 6, 1]
B: [2, 4, 5, 8, 3, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[y_2 - y_3 + 4\,y_4, 0, 0, -y_1 + 4\,y_2 + y_4 - y_5, y_1, y_2, y_3, y_4, y_5]$$

$p = -s^4 + s^6$ $p' = -s^4 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {3, 5}} order: 4

See Matrix

$$[2\,y_1 - y_2 + 3\,y_3, 3\,y_1 + 2\,y_3 - y_4 - y_5, y_1, y_2, y_3, 0, y_4, y_5, 0]$$

$p' = -s^2 + s^6$ $p = -s^2 + s^6$

126 . Coloring, {2, 6, 7, 9}

R: [4, 9, 4, 7, 7, 8, 5, 1, 2]
B: [2, 4, 5, 8, 3, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	6 *vs* 8

Omega Rank for R : cycles: {{5, 7}, {2, 9}} order: 4

See Matrix

$$[3\,y_5 - y_2 + 2\,y_1, y_5, 0, y_4, y_3, 0, y_2, 2\,y_5 - y_4 - y_3 + 3\,y_1, y_1]$$

$p = s^4 - s^6$ $p' = s^4 - s^6$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 4, 6, 7, 8}} order: 6

See Matrix

$$[3\,y_1 - y_3 + 2\,y_2 - y_4, 2\,y_1 + 3\,y_2 - y_5 - y_6, y_1, y_3, y_2, y_4, y_5, y_6, 0]$$

$p = -s + s^7$ $p' = -s + s^7$

127 . Coloring, {2, 6, 8, 9}

R: [4, 9, 4, 7, 7, 8, 1, 6, 2]
B: [2, 4, 5, 8, 3, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	4 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {1, 4, 7}, {6, 8}} order: 6

See Matrix

$$[y_3, y_4, 0, -y_3 - y_2 + 4\,y_4 + 4\,y_1, 0, y_1, y_2, y_4, y_1]$$

$p = -s - s^2 + s^4 + s^5$ $p = s - s^3 - s^4 + s^6$ $p = -s + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {3, 5}} order: 4

See Matrix

$$[9\,y_1 - 2\,y_2 - 11\,y_3 + 9\,y_5, 2\,y_1, 7\,y_1 - 9\,y_3 - 2\,y_4 + 7\,y_5, 2\,y_2, 2\,y_3, 0, 2\,y_4, 2\,y_5, 0]$$

$p = -s^2 + s^6$ $p' = -s^2 + s^6$

128 . Coloring, {2, 7, 8, 9}

R: [4, 9, 4, 7, 7, 7, 5, 6, 2]
B: [2, 4, 5, 8, 3, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	7 *vs* 7	7 *vs* 7	3 *vs* 6	4 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {2, 9}} order: 2

See Matrix

$$[0, y_1 + 3\,y_2 - 4\,y_3, 0, 2\,y_2, y_1, y_2, 4\,y_1 + 12\,y_2 - 15\,y_3, 0, y_3]$$

$p' = s^2 - s^4$ $p = s^2 - s^4$ $p' = -s^3 + s^5$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {3, 5}} order: 4

See Matrix

$$[3\,y_1 - y_2 + 2\,y_3, 2\,y_1 + 3\,y_3 - y_4, y_1, y_2, y_3, 0, 0, y_4, 0]$$

$p = -s + s^5$ $p' = -s + s^5$

129 . Coloring, {3, 4, 5, 6}

R: [4, 4, 5, 8, 3, 8, 1, 1, 1]
B: [2, 9, 4, 7, 7, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	3 *vs* 6

Omega Rank for R : cycles: {{3, 5}, {1, 4, 8}} order: 6

See Matrix

$$[y_4, 0, y_3, y_2, y_1, 0, 0, -y_4 + 5\, y_3 - y_2 + 5\, y_1, 0]$$

$$p = - s - s^2 + s^4 + s^5$$

Omega Rank for B : cycles: {{5, 7}, {2, 9}} order: 2

See Matrix

$$[0, y_3 - y_2, 0, y_1, -3\, y_1 + y_3, 2\, y_1, y_3, 0, y_2]$$

$$p = - s^2 + s^4 \quad p' = - s^2 + s^4 \quad p = - s^2 + s^6$$

130 . Coloring, {3, 4, 5, 7}

R: [4, 4, 5, 8, 3, 7, 5, 1, 1]
B: [2, 9, 4, 7, 7, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{3, 5}, {1, 4, 8}} order: 6

See Matrix

$$[11\, y_1 - 7\, y_2 + 11\, y_3 + 11\, y_4 - 7\, y_5, 0, 7\, y_1, 7\, y_2, 7\, y_3, 0, 7\, y_4, 7\, y_5, 0]$$

$$p = - s^2 - s^3 + s^5 + s^6$$

Omega Rank for B : cycles: {{2, 9}, {6, 8}} order: 4

See Matrix

$$[y_1, 4\,y_2 - y_3 + y_4, 0, -y_1 + y_2 + 4\,y_4 - y_5, 0, y_2, y_3, y_4, y_5]$$

$p' = s^4 - s^6$ $p = s^4 - s^6$

131 . Coloring, {3, 4, 5, 8}

R: [4, 4, 5, 8, 3, 7, 1, 6, 1]
B: [2, 9, 4, 7, 7, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 7	4 *vs* 7

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}, {3, 5}}

See Matrix

$$[5\,y_1 - y_2 + 5\,y_4 - y_3 - y_5 - y_6, 0, y_1, y_2, y_4, y_3, y_5, y_6, 0]$$

$p = -s - s^2 + s^6 + s^7$

Omega Rank for B : cycles: {{5, 7}, {2, 9}} order: 4

See Matrix

$$[y_1, -y_3 + y_4, 0, y_3, y_1 - y_3 + y_2, 0, y_4, y_3, y_2]$$

$p' = s^4 - s^6$ $p' = s^3 - s^5$ $p = s^3 - s^7$

132 . Coloring, {3, 4, 5, 9}

R: [4, 4, 5, 8, 3, 7, 1, 1, 2]
B: [2, 9, 4, 7, 7, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	5 *vs* 8

Omega Rank for R : cycles: {{1, 4, 8}, {3, 5}} order: 6

See Matrix

$$[-2\,y_4 + 5\,y_1 - y_2 + 5\,y_3 - y_5,\ y_4,\ y_1,\ y_2,\ y_3,\ 0,\ y_4,\ y_5,\ 0]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{5, 7}, {1, 2, 9}, {6, 8}} order: 6

See Matrix

$$[-y_1 + 2\,y_3 + 2\,y_4 - y_5,\ y_1,\ 0,\ -y_2 + y_3 + 2\,y_4,\ y_2,\ y_3,\ 2\,y_3 + y_4,\ y_4,\ y_5]$$

$p = -s^2 + s^8$ $p = -s^2 + s^4 + s^5 - s^7$ $p = s^2 + s^3 - s^5 - s^6$

133 . Coloring, {3, 4, 6, 7}

$\Omega p(\Delta)=0$: $p = s^3 - 3s^4 + 8s^7$

R: [4, 4, 5, 8, 7, 8, 5, 1, 1]
B: [2, 9, 4, 7, 3, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	6 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}, {5, 7}} order: 6

See Matrix

$$[y_4,\ 0,\ 0,\ y_3,\ y_2,\ 0,\ y_1,\ -y_4 - y_3 + 2\,y_2 + 2\,y_1,\ 0]$$

$p = -s - s^2 + s^4 + s^5$

Omega Rank for B : cycles: {{2, 9}} order: 6

See Matrix

$$[y_1,\ y_2,\ y_4,\ y_3,\ 0,\ y_4,\ y_5,\ 0,\ y_6]$$

$p = s^5 - s^7$

134 . Coloring, {3, 4, 6, 8}

R: [4, 4, 5, 8, 7, 8, 1, 6, 1]
B: [2, 9, 4, 7, 3, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{6, 8}} order: 6

See Matrix

$$[y_2, 0, 0, y_2 + y_1 - y_3 - y_4 + y_5, y_1, y_3, y_4, y_5, 0]$$

$p = -s^5 + s^6$

Omega Rank for B : cycles: {{3, 4, 5, 7}, {2, 9}} order: 4

See Matrix

$$[2\,y_4, 2\,y_4 + 2\,y_5, 2\,y_3, 2\,y_2, 2\,y_1, 0, 5\,y_4 - 2\,y_3 - 2\,y_2 - 2\,y_1 + 5\,y_5, 0, 2\,y_5]$$

$p' = s^2 - s^6$ $p = s^2 - s^6$

135 . Coloring, {3, 4, 6, 9}

R: [4, 4, 5, 8, 7, 8, 1, 1, 2]
B: [2, 9, 4, 7, 3, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	3 *vs* 6	6 *vs* 8

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_1, -y_1 + y_3 + y_2, 0, y_1, -y_1 + y_3 + y_2, 0, y_3, y_2, 0]$$

$p' = -s^3 + s^5$ $p = s^3 - s^4$ $p' = -s^3 + s^4$

Omega Rank for B : cycles: {{3, 4, 5, 7}, {1, 2, 9}}

See Matrix

$$[-y_4 + y_1 + y_2 + y_3 - y_5, y_4, -y_6 + y_1 + y_2 + y_3, y_1, y_2, y_3, y_6, 0, y_5]$$

$p' = -s^2 - s^4 + s^5 + s^7$ $p = -s^2 - s^4 + s^5 + s^7$

136 . Coloring, {3, 4, 7, 8}

R: [4, 4, 5, 8, 7, 7, 5, 6, 1]
B: [2, 9, 4, 7, 3, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 6	6 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 6

See Matrix

$$[y_1, 0, 0, y_2, y_3, y_4, y_5, y_6, 0]$$

Omega Rank for B : cycles: {{2, 9}} order: 6

See Matrix

$$[y_2, y_3, 2\,y_6, y_1, 0, 0, y_4, y_6, y_5]$$

$p = s^5 - s^7$

137 . Coloring, {3, 4, 7, 9}

R: [4, 4, 5, 8, 7, 7, 5, 1, 2]
B: [2, 9, 4, 7, 3, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 6	7 *vs* 8

Omega Rank for R : cycles: {{5, 7}, {1, 4, 8}} order: 6

See Matrix

$$[-7\,y_1 - 7\,y_2 + 11\,y_3 + 11\,y_4 - 7\,y_5, 7\,y_1, 0, 7\,y_2, 7\,y_3, 0, 7\,y_4, 7\,y_5, 0]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 9}, {6, 8}} order: 6

See Matrix

$$[-y_1 - y_2 - y_3 + 5\,y_4 - y_5 + 5\,y_6 - y_7, y_1, y_2, y_3, 0, y_4, y_5, y_6, y_7]$$

$p = -s^4 - s^5 + s^7 + s^8$

138 . Coloring, {3, 4, 8, 9}

R: [4, 4, 5, 8, 7, 7, 1, 6, 2]
B: [2, 9, 4, 7, 3, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 7	5 *vs* 8

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}} order: 5

See Matrix

$$[y_1, y_5, 0, y_2, y_5, y_6, y_3, y_4, 0]$$

$p = -s^2 + s^7$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 4, 5, 7}}

See Matrix

$$[y_5 + y_4, y_5 + y_4, 3\,y_5 + 3\,y_4 - y_1 - y_2 - y_3, y_1, y_2, 0, y_3, y_5, y_4]$$

$p = -s^2 + s^6$ $p' = -s^3 + s^7$ $p' = -s^2 + s^6$

139 . Coloring, {3, 5, 6, 7}

R: [4, 4, 5, 7, 3, 8, 5, 1, 1]
B: [2, 9, 4, 8, 7, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 6	7 *vs* 7

Omega Rank for R : cycles: {{3, 5}} order: 6

See Matrix

$$[y_6, 0, y_4, y_5, y_2, 0, y_3, y_1, 0]$$

Omega Rank for B : cycles: {{2, 9}} order: 6

See Matrix

$$[y_1, y_3, 0, y_2, 0, y_6, y_5, y_4, y_7]$$

140 . Coloring, {3, 5, 6, 8}

R: [4, 4, 5, 7, 3, 8, 1, 6, 1]
B: [2, 9, 4, 8, 7, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	4 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{3, 5}, {1, 4, 7}, {6, 8}} order: 6

See Matrix

$$[-y_2 + 4\,y_4 + 4\,y_1 - y_3, 0, y_1, y_2, y_4, y_1, y_3, y_4, 0]$$

$$p = -s - s^2 + s^4 + s^5 \quad p' = -s - s^2 + s^4 + s^5 \quad p = -s + s^7$$

Omega Rank for B : cycles: {{5, 7}, {2, 9}} order: 4

See Matrix

$$[y_1, y_2, 0, -y_1 - y_2 + 4\,y_3 - y_4 - y_5, y_3, 0, y_3, y_4, y_5]$$

$$p = -s^4 + s^6 \quad p' = -s^4 + s^6$$

141 . Coloring, {3, 5, 6, 9}

R: [4, 4, 5, 7, 3, 8, 1, 1, 2]

B: [2, 9, 4, 8, 7, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	6 *vs* 8

Omega Rank for R : cycles: {{3, 5}, {1, 4, 7}} order: 6

See Matrix

$$[-2\,y_2 + 5\,y_1 - y_4 + 5\,y_5 - y_3, y_2, y_1, y_4, y_5, 0, y_3, y_2, 0]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{5, 7}, {1, 2, 9}} order: 6

See Matrix

$$[-y_1 + y_4 + y_5 + y_2 - y_6, y_1, 0, y_4, y_5, y_2, y_3, y_4 + y_5 + y_2 - y_3, y_6]$$

$p' = -s^4 + s^7$ $p = -s^4 + s^7$

142 . Coloring, {3, 5, 7, 8}

Ωp(Δ)=0: $p = s^2 + 2s^4 - 16s^7$

R: [4, 4, 5, 7, 3, 7, 5, 6, 1]
B: [2, 9, 4, 8, 7, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{3, 5}} order: 4

See Matrix

$$[y_1, 0, y_5, y_4, y_3, 2\,y_1, y_2, 0, 0]$$

$p = s^4 - s^6$

Omega Rank for B : cycles: {{2, 9}} order: 4

See Matrix

$$[y_1, y_2, 0, y_3, 0, 0, 2\,y_3, y_5, y_4]$$

$p = -s^4 + s^6$

143 . Coloring, {3, 5, 7, 9}

R: [4, 4, 5, 7, 3, 7, 5, 1, 2]
B: [2, 9, 4, 8, 7, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{3, 5}} order: 4

See Matrix

$$[2\,y_1, y_1, -3\,y_1 + y_2 + y_3 - y_4, y_2, y_3, 0, y_4, 0, 0]$$

$p = s^4 - s^6$ $p' = s^4 - s^5$

Omega Rank for B : cycles: {{6, 8}, {1, 2, 9}} order: 6

See Matrix

$$[3\,y_3, 3\,y_2, 0, -7\,y_3 - 7\,y_2 + 11\,y_1 + 11\,y_5 - 7\,y_4, 0, 3\,y_1, -14\,y_3 - 14\,y_2 + 22\,y_1 + 22\,y_5 - 14\,y_4, 3\,y_5, 3\,y_4]$$

$p = s^2 - s^4 - s^5 + s^7$ $p = -s^2 - s^3 + s^5 + s^6$

144 . Coloring, {3, 5, 8, 9}

R: [4, 4, 5, 7, 3, 7, 1, 6, 2]
B: [2, 9, 4, 8, 7, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	6 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}, {3, 5}} order: 6

See Matrix

$$[y_2, y_3, y_4, y_5, y_1, 2\,y_3, -y_2 - 3\,y_3 + 5\,y_4 - y_5 + 5\,y_1, 0, 0]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p' = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{5, 7}, {1, 2, 9}} order: 6

See Matrix

$$[-5\,y_1 - 5\,y_2 + 13\,y_3 + 13\,y_4 - 5\,y_5 - 5\,y_6, 5\,y_1, 0, 5\,y_2, 5\,y_3, 0, 5\,y_4, 5\,y_5, 5\,y_6]$$

$p = -s^3 - s^4 + s^6 + s^7$

145 . Coloring, {3, 6, 7, 8}

R: [4, 4, 5, 7, 7, 8, 5, 6, 1]
B: [2, 9, 4, 8, 3, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	6 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[y_2 + 4\,y_4 - y_1, 0, 0, -y_3 + 4\,y_2 + y_4, y_3, y_2, y_1, y_4, 0]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$

Omega Rank for B : cycles: {{2, 9}} order: 6

See Matrix

$$[y_5, y_4, 2\,y_2, y_3, 0, 0, y_2, y_1, y_6]$$

$p = s^5 - s^7$

146 . Coloring, {3, 6, 7, 9}

R: [4, 4, 5, 7, 7, 8, 5, 1, 2]
B: [2, 9, 4, 8, 3, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 6	8 *vs* 8

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1, y_5, 0, y_2, y_3, 0, y_4, y_5, 0]$$

$$p = -s^4 + s^6$$

Omega Rank for B : cycles: {{1, 2, 9}} order: 6

See Matrix

$$[y_3, y_4, y_5, y_2, 0, y_8, y_1, y_7, y_6]$$

147 . Coloring, {3, 6, 8, 9}

R: [4, 4, 5, 7, 7, 8, 1, 6, 2]
B: [2, 9, 4, 8, 3, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	8 *vs* 8

Omega Rank for R : cycles: {{6, 8}, {1, 4, 7}} order: 6

See Matrix

$$[-2\,y_4 - y_1 + 5\,y_3 - y_2 + 5\,y_5, y_4, 0, y_1, y_4, y_3, y_2, y_5, 0]$$

$$p' = s^2 + s^3 - s^5 - s^6 \quad p = -s^2 - s^3 + s^5 + s^6$$

Omega Rank for B : cycles: {{1, 2, 9}} order: 6

See Matrix

$$[y_1, y_5, y_4, y_3, y_2, 0, y_8, y_7, y_6]$$

148 . Coloring, {3, 7, 8, 9}

R: [4, 4, 5, 7, 7, 7, 5, 6, 2]
B: [2, 9, 4, 8, 3, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	6 *vs* 6

Omega Rank for R : cycles: {{5, 7}} order: 4

See Matrix

$$[0, y_4, 0, y_2, y_3, 2\,y_4, y_1, 0, 0]$$

$p = s^3 - s^5$

Omega Rank for B : cycles: {{1, 2, 9}} order: 6

See Matrix

$$[y_1, y_2, y_4, y_3, 0, 0, 0, y_5, y_6]$$

149 . Coloring, {4, 5, 6, 7}

R: [4, 4, 4, 8, 3, 8, 5, 1, 1]
B: [2, 9, 5, 7, 7, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 5	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_4, 0, y_2, y_3, y_1, 0, 0, y_5, 0]$$

Omega Rank for B : cycles: {{2, 9}} order: 4

See Matrix

$$[y_1, y_2, 0, 0, y_3, 2\,y_3, y_4, 0, y_5]$$

$p = -s^4 + s^6$

150 . Coloring, {4, 5, 6, 8}

$\Omega p(\Delta)=0$: $p = s^3 - s^4 + 4s^5 - 8s^7$

R: [4, 4, 4, 8, 3, 8, 1, 6, 1]
B: [2, 9, 5, 7, 7, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	3 *vs* 5

Omega Rank for R : cycles: {{6, 8}} order: 4

See Matrix

$$[2\,y_1, 0, y_1, y_3, 0, y_2, 0, y_4, 0]$$

$p = -s^3 + s^5$

Omega Rank for B : cycles: {{5, 7}, {2, 9}} order: 2

See Matrix

$$[2\,y_1 - 2\,y_3, 2\,y_1, 0, 0, 5\,y_1 - 2\,y_2, 0, 2\,y_2, 0, 2\,y_3]$$

$p = -s^2 + s^4$ $p' = -s^2 + s^4$

151 . Coloring, {4, 5, 6, 9}

R: [4, 4, 4, 8, 3, 8, 1, 1, 2]
B: [2, 9, 5, 7, 7, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 5	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_1, y_2, 2\,y_2, y_4, 0, 0, 0, y_3, 0]$$

$p = -s^2 + s^5$

Omega Rank for B : cycles: {{5, 7}, {1, 2, 9}} order: 6

See Matrix

$$[-y_1 + y_4 - y_2, y_1, 0, 0, y_4 - y_3, y_3, y_4, 0, y_2]$$

$p = s^2 - s^5$ $p' = -s^2 + s^5$

152 . Coloring, {4, 5, 7, 8}

R: [4, 4, 4, 8, 3, 7, 5, 6, 1]
B: [2, 9, 5, 7, 7, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	7 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{3, 4, 5, 6, 7, 8}} order: 6

See Matrix

$$[y_1, 0, y_2, y_3, y_4, y_5, y_6, y_7, 0]$$

Omega Rank for B : cycles: {{2, 9}} order: 4

See Matrix

$$[y_2, y_1, 0, 0, y_3, 0, y_5, y_3, y_4]$$

$p = -s^4 + s^6$

153 . Coloring, {4, 5, 7, 9}

R: [4, 4, 4, 8, 3, 7, 5, 1, 2]
B: [2, 9, 5, 7, 7, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 7	6 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}} order: 6

See Matrix

$$[y_1, y_2, y_4, y_5, y_6, 0, y_2, y_3, 0]$$

$p = -s^4 + s^7$

Omega Rank for B : cycles: {{6, 8}, {1, 2, 9}} order: 6

See Matrix

$$[y_1, -y_1 - y_3 + 5\,y_2 - y_6 + 5\,y_5 - y_4, 0, 0, y_3, y_2, y_6, y_5, y_4]$$

$p = -s^3 - s^4 + s^6 + s^7$

154 . Coloring, {4, 5, 8, 9}

R: [4, 4, 4, 8, 3, 7, 1, 6, 2]
B: [2, 9, 5, 7, 7, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 7	3 *vs* 6

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}} order: 5

See Matrix

$$[y_5, y_6, 2\,y_6, y_4, 0, y_3, y_1, y_2, 0]$$

$p = s^2 - s^7$

Omega Rank for B : cycles: {{5, 7}, {1, 2, 9}} order: 6

See Matrix

$$[y_3 + y_2, y_3 + y_2, 0, 0, 3\,y_3 + 3\,y_2 - y_1, 0, y_1, y_3, y_2]$$

$p' = -s^3 + s^5$ $p' = -s^2 + s^4$ $p = s^2 - s^4$

155 . Coloring, {4, 6, 7, 8}

R: [4, 4, 4, 8, 7, 8, 5, 6, 1]
B: [2, 9, 5, 7, 3, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	4 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[-14\,y_1 + 39\,y_2 - 14\,y_3 - y_4, 0, 0, y_1, y_2, y_3, -5\,y_1 + 14\,y_2 - 5\,y_3, y_4, 0]$$

$p = s^3 - s^5$ $p' = s^3 - s^5$

Omega Rank for B : cycles: {{2, 9}, {3, 5}} order: 4

See Matrix

$$[y_4, y_3, y_2, 0, y_1, 0, -y_3 + 3\,y_2 + 2\,y_1, 0, -y_4 + 2\,y_2 + 3\,y_1]$$

$p = -s^3 + s^5$ $p' = s^3 - s^5$

156 . Coloring, {4, 6, 7, 9}

R: [4, 4, 4, 8, 7, 8, 5, 1, 2]
B: [2, 9, 5, 7, 3, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	6 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {1, 4, 8}} order: 6

See Matrix

$$[-5\,y_1 - 5\,y_2 + 13\,y_3 + 13\,y_4 - 5\,y_5, 5\,y_1, 0, 5\,y_2, 5\,y_3, 0, 5\,y_4, 5\,y_5, 0]$$

$p = s^2 + s^3 - s^5 - s^6$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 5}} order: 6

See Matrix

$$[-y_1 + 5\,y_2 + 5\,y_3 - y_4 - y_5 - y_6, y_1, y_2, 0, y_3, y_4, y_5, 0, y_6]$$

$$p = s^3 + s^4 - s^6 - s^7$$

157 . Coloring, {4, 6, 8, 9}

R: [4, 4, 4, 8, 7, 8, 1, 6, 2]
B: [2, 9, 5, 7, 3, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{6, 8}} order: 4

See Matrix

$$[y_4, y_5, 0, y_3, 0, y_2, 2\,y_5, y_1, 0]$$

$$p = s^4 - s^6$$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 5}} order: 6

See Matrix

$$[4\,y_5, 4\,y_4, 4\,y_3, 0, 4\,y_2, 0, 5\,y_5 + 5\,y_4 - 4\,y_3 - 4\,y_2 + 5\,y_1, 0, 4\,y_1]$$

$$p = -s^2 - s^3 + s^5 + s^6$$

158 . Coloring, {4, 7, 8, 9}

R: [4, 4, 4, 8, 7, 7, 5, 6, 2]
B: [2, 9, 5, 7, 3, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 6

See Matrix

$$[0, y_5, 0, y_4, y_3, y_1, y_2, y_6, 0]$$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 5}} order: 6

See Matrix

$$[-y_5 + 5\,y_4 + 5\,y_3 - 4\,y_2 - y_1, y_5, y_4, 0, y_3, 0, 3\,y_2, y_2, y_1]$$

$p' = -s^2 - s^3 + s^5 + s^6 \quad p = s^2 + s^3 - s^5 - s^6$

159 . Coloring, {5, 6, 7, 8}

R: [4, 4, 4, 7, 3, 8, 5, 6, 1]
B: [2, 9, 5, 8, 7, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{6, 8}, {3, 4, 5, 7}} order: 4

See Matrix

$$[-y_1 + y_3 + 4\,y_5 - y_4, 0, y_1, -y_2 + 4\,y_3 + y_5, y_2, y_3, y_4, y_5, 0]$$

$p' = -s^2 + s^6 \quad p = -s^2 + s^6$

Omega Rank for B : cycles: {{2, 9}} order: 4

See Matrix

$$[y_2, y_1, 0, 0, y_3, 0, y_4, 3\,y_3, y_5]$$

$p = -s^4 + s^6$

160 . Coloring, {5, 6, 7, 9}

R: [4, 4, 4, 7, 3, 8, 5, 1, 2]
B: [2, 9, 5, 8, 7, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 7	6 *vs* 7

Omega Rank for R : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_1, y_3, y_6, y_4, y_5, 0, y_2, y_3, 0]$$

$p = -s^3 + s^7$

Omega Rank for B : cycles: {{1, 2, 9}} order: 6

See Matrix

$$[y_2, y_1, 0, 0, y_4, y_3, y_6, 3\,y_4, y_5]$$

$p = -s^4 + s^7$

161 . Coloring, {5, 6, 8, 9}

R: [4, 4, 4, 7, 3, 8, 1, 6, 2]
B: [2, 9, 5, 8, 7, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{6, 8}, {1, 4, 7}} order: 6

See Matrix

$$[-3\,y_1 - y_2 + 5\,y_3 - y_4 + 5\,y_5, y_1, 2\,y_1, y_2, 0, y_3, y_4, y_5, 0]$$

$p = -s^2 - s^3 + s^5 + s^6 \quad p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 9}, {5, 7}} order: 6

See Matrix

$$[-7\,y_1 + 11\,y_2 + 11\,y_3 - 7\,y_4 - 7\,y_5, 7\,y_1, 0, 0, 7\,y_2, 0, 7\,y_3, 7\,y_4, 7\,y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$

162 . Coloring, {5, 7, 8, 9}

R: [4, 4, 4, 7, 3, 7, 5, 6, 2]
B: [2, 9, 5, 8, 7, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[0, y_1, y_2, y_5, y_4, 2\,y_1, y_3, 0, 0]$$

$p = -s^2 + s^6$

Omega Rank for B : cycles: {{1, 2, 9}} order: 3

See Matrix

$$[y_1, y_2, 0, 0, y_3, 0, y_5, 4\,y_3, y_4]$$

$p = -s^3 + s^6$

163 . Coloring, {6, 7, 8, 9}

R: [4, 4, 4, 7, 7, 8, 5, 6, 2]
B: [2, 9, 5, 8, 3, 7, 1, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[0, y_2 + 4\,y_4 - y_3, 0, -y_1 + 4\,y_2 + y_4, y_1, y_2, y_3, y_4, 0]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 5}} order: 6

See Matrix

$$[y_2, y_3, y_4, 0, y_5, 0, y_1, 3\,y_1, -y_2 - y_3 + 5\,y_4 + 5\,y_5 - 4\,y_1]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$

164 . Coloring, {2, 3, 4, 5, 6}

R: [4, 9, 5, 8, 3, 8, 1, 1, 1]
B: [2, 4, 4, 7, 7, 7, 5, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	4 *vs* 5

Omega Rank for R : cycles: {{1, 4, 8}, {3, 5}} order: 6

See Matrix

$$[y_5, 0, y_3, y_4, y_2, 0, 0, y_1, -y_5 + 5\,y_3 - y_4 + 5\,y_2 - y_1]$$

$p = s^2 + s^3 - s^5 - s^6$

Omega Rank for B : cycles: {{5, 7}} order: 4

See Matrix

$$[0, 2\,y_3, 0, y_1, y_2, y_3, y_4, 0, 0]$$

$p = -s^3 + s^5$

165 . Coloring, {2, 3, 4, 5, 7}

R: [4, 9, 5, 8, 3, 7, 5, 1, 1]
B: [2, 4, 4, 7, 7, 8, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}, {3, 5}} order: 6

See Matrix

$$[3\,y_2,\ 0,\ 3\,y_1,\ 3\,y_4,\ 3\,y_5,\ 0,\ -7\,y_2 + 11\,y_1 - 7\,y_4 + 11\,y_5 - 7\,y_3,\ 3\,y_3,\ -14\,y_2 + 22\,y_1 - 14\,y_4 + 22\,y_5 - 14\,y_3]$$

$p = s^2 - s^4 - s^5 + s^7$ $p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}, {6, 8}} order: 4

See Matrix

$$[y_1 + 4\,y_3 - y_2,\ 4\,y_1 - y_4 + y_3,\ 0,\ y_2,\ 0,\ y_1,\ y_4,\ y_3,\ 0]$$

$p = -s + s^5$ $p' = -s + s^5$

166 . Coloring, {2, 3, 4, 5, 8}

R: [4, 9, 5, 8, 3, 7, 1, 6, 1]
B: [2, 4, 4, 7, 7, 8, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	7 *vs* 8	6 *vs* 6

Omega Rank for R : cycles: {{3, 5}, {1, 4, 6, 7, 8}}

See Matrix

$$[5\,y_5 - y_6 + 5\,y_4 - y_2 - y_3 - y_1 - y_7,\ 0,\ y_5,\ y_6,\ y_4,\ y_2,\ y_3,\ y_1,\ y_7]$$

$p = -s^2 - s^3 + s^7 + s^8$

Omega Rank for B : cycles: {{5, 7}} order: 6

See Matrix

$$[y_1,\ y_2,\ 0,\ y_3,\ y_4,\ 0,\ y_5,\ y_6,\ 0]$$

167 . Coloring, {2, 3, 4, 5, 9}

R: [4, 9, 5, 8, 3, 7, 1, 1, 2]
B: [2, 4, 4, 7, 7, 8, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 8	5 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {3, 5}, {1, 4, 8}} order: 6

See Matrix

$$[4\,y_1 + 4\,y_4 - y_5 - y_3 - y_2, y_1, y_4, y_5, y_1, 0, y_3, y_2, y_4]$$

$p = s^2 + s^3 - s^5 - s^6$ $p = s^2 - s^4 - s^5 + s^7$ $p = -s^2 + s^8$

Omega Rank for B : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[y_3, y_4, 0, -y_3 - y_1 + 2\,y_2 + 3\,y_5, y_1, y_2, -y_4 + 3\,y_2 + 2\,y_5, y_5, 0]$$

$p' = -s^4 + s^6$ $p = -s^4 + s^6$

168 . Coloring, {2, 3, 4, 6, 7}

Ωp(Δ)=0: $p = s^2 + 2s^4 - 8s^5 - 16s^7$

R: [4, 9, 5, 8, 7, 8, 5, 1, 1]
B: [2, 4, 4, 7, 3, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {1, 4, 8}} order: 6

See Matrix

$$[-y_2 + 2\,y_3 + 2\,y_1 - y_4 - y_5, 0, 0, y_2, y_3, 0, y_1, y_4, y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1, y_2, y_3, y_4, 0, y_3, y_5, 0, 0]$$

$p = -s^2 + s^6$

169 . Coloring, {2, 3, 4, 6, 8}

R: [4, 9, 5, 8, 7, 8, 1, 6, 1]
B: [2, 4, 4, 7, 3, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	6 *vs* 6

Omega Rank for R : cycles: {{6, 8}} order: 6

See Matrix

$$[y_2 + y_1 + y_3 + y_4 - y_5, 0, 0, y_2, y_1, y_3, y_4, y_5, 2\,y_1]$$

$p = -s^5 + s^7$ $p = -s^5 + s^6$

Omega Rank for B : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_1, y_2, y_3, y_4, y_6, 0, y_5, 0, 0]$$

170 . Coloring, {2, 3, 4, 6, 9}

R: [4, 9, 5, 8, 7, 8, 1, 1, 2]
B: [2, 4, 4, 7, 3, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {1, 4, 8}} order: 6

See Matrix

$$[5\,y_1 - y_6 - y_5 - y_4 - y_3 + 5\,y_2, y_1, 0, y_6, y_5, 0, y_4, y_3, y_2]$$

$p = -s^3 - s^4 + s^6 + s^7$

Omega Rank for B : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_1, 3\,y_1 - y_2 + y_3 + y_4 - y_5, y_2, y_3, y_4, 2\,y_1, y_5, 0, 0\,]$$

$p = -s^3 + s^7$ $p = -s^3 + s^4 - s^5 + s^6$

171 . Coloring, {2, 3, 4, 7, 8}

R: [4, 9, 5, 8, 7, 7, 5, 6, 1]
B: [2, 4, 4, 7, 3, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	7 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{5, 7}} order: 6

See Matrix

$$[y_1, 0, 0, y_2, y_3, y_4, y_5, y_6, y_7]$$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_2, y_3, 2\,y_5, y_1, 0, 0, y_4, y_5, 0]$$

$p = -s^2 + s^6$

172 . Coloring, {2, 3, 4, 7, 9}

R: [4, 9, 5, 8, 7, 7, 5, 1, 2]
B: [2, 4, 4, 7, 3, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	4 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {2, 9}, {1, 4, 8}} order: 6

See Matrix

$$[-2\,y_1 + 8\,y_3 - 2\,y_2 - 8\,y_4,\ 3\,y_3 - 5\,y_4,\ 0,\ 2\,y_1,\ 2\,y_3,\ 0,\ 5\,y_3 - 7\,y_4,\ 2\,y_2,\ 2\,y_4]$$

$p = -s - s^2 + s^4 + s^5$ $p = s - s^3 - s^4 + s^6$ $p = -s + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 7}, {6, 8}} order: 4

See Matrix

$$[-y_2 + 2\,y_3 + 3\,y_5,\ -y_1 + 3\,y_3 - y_4 + 2\,y_5,\ y_1,\ y_2,\ 0,\ y_3,\ y_4,\ y_5,\ 0]$$

$p' = -s^2 + s^6$ $p = -s^2 + s^6$

173 . Coloring, {2, 3, 4, 8, 9}

R: [4, 9, 5, 8, 7, 7, 1, 6, 2]
B: [2, 4, 4, 7, 3, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	3 *vs* 8	6 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {1, 4, 6, 7, 8}}

See Matrix

$$[y_2,\ y_2 - y_3,\ 0,\ y_2,\ y_2 - y_1,\ y_1,\ y_2,\ y_2,\ y_3]$$

$p' = -s^2 + s^6$ $p = -s^2 + s^4$ $p' = -s^2 + s^4$ $p = -s^2 + s^8$ $p = -s^2 + s^6$

Omega Rank for B : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_2,\ y_1,\ y_2 - y_1 + y_6 + y_5 - y_4 - y_3,\ y_6,\ y_5,\ 0,\ y_4,\ y_3,\ 0]$$

$p = -s^4 + s^5 - s^6 + s^7$

174 . Coloring, {2, 3, 5, 6, 7}

R: [4, 9, 5, 7, 3, 8, 5, 1, 1]
B: [2, 4, 4, 8, 7, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{3, 5}} order: 6

See Matrix

$$[y_1, 0, y_2, y_3, y_4, 0, y_5, y_6, 2\,y_6]$$

$p = -s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 6, 7, 8}} order: 6

See Matrix

$$[y_4 + y_2 - y_1, y_3, 0, y_4, 0, -y_3 + y_4 + y_2, y_2, y_1, 0]$$

$p = s - s^3 + s^4 - s^6$ $p' = s - s^2 + s^4 - s^5$

175 . Coloring, {2, 3, 5, 6, 8}

R: [4, 9, 5, 7, 3, 8, 1, 6, 1]
B: [2, 4, 4, 8, 7, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 8	4 *vs* 6

Omega Rank for R : cycles: {{3, 5}, {1, 4, 7}, {6, 8}} order: 6

See Matrix

$$[y_4, 0, y_3, y_1, y_2, y_3, -y_4 + 4\,y_3 - y_1 + 4\,y_2 - y_5, y_2, y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p' = -s^2 - s^3 + s^5 + s^6$ $p = -s^2 + s^8$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {5, 7}} order: 4

See Matrix

$$[-y_1 - y_2 + 4\,y_3 - y_4, y_1, 0, y_2, y_3, 0, y_3, y_4, 0]$$

$p = s - s^5$ $p' = s - s^5$

176 . Coloring, {2, 3, 5, 6, 9}

R: [4, 9, 5, 7, 3, 8, 1, 1, 2]
B: [2, 4, 4, 8, 7, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 8	6 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {3, 5}, {1, 4, 7}} order: 6

See Matrix

$$[4\,y_4 - y_3 + 4\,y_2 - y_1 - y_5,\ y_2,\ y_4,\ y_3,\ y_2,\ 0,\ y_1,\ y_5,\ y_4]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$ $p = -s^2 + s^8$

Omega Rank for B : cycles: {{5, 7}} order: 6

See Matrix

$$[y_1,\ y_1 + y_6 + y_4 + y_5 - y_3 - y_2,\ 0,\ y_6,\ y_4,\ y_5,\ y_3,\ y_2,\ 0]$$

$p = -s^6 + s^7$

177 . Coloring, {2, 3, 5, 7, 8}

$\Omega p(\Delta)=0$: $p = s^3 + s^4 + 4s^5 + 8s^7$

R: [4, 9, 5, 7, 3, 7, 5, 6, 1]
B: [2, 4, 4, 8, 7, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	6 *vs* 7	5 *vs* 5

Omega Rank for R : cycles: {{3, 5}} order: 6

See Matrix

$$[y_1,\ 0,\ y_2,\ y_3,\ y_4,\ y_6,\ y_5,\ 0,\ y_6]$$

$p = s^5 - s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1, y_2, 0, y_3, 0, 0, y_4, y_5, 0]$$

178 . Coloring, {2, 3, 5, 7, 9}

R: [4, 9, 5, 7, 3, 7, 5, 1, 2]
B: [2, 4, 4, 8, 7, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {3, 5}} order: 4

See Matrix

$$[y_2, y_1, -y_2 + 2\,y_1 - y_3 + 3\,y_5, 3\,y_1 - y_4 + 2\,y_5, y_4, 0, y_3, 0, y_5]$$

$p' = -s^4 + s^6 \quad p = s^4 - s^6$

Omega Rank for B : cycles: {{6, 8}} order: 6

See Matrix

$$[y_1, y_1 + y_2 + y_3 - y_5 - y_4, 0, y_2, 0, y_3, y_5, y_4, 0]$$

$p = -s^5 + s^6$

179 . Coloring, {2, 3, 5, 8, 9}

R: [4, 9, 5, 7, 3, 7, 1, 6, 2]
B: [2, 4, 4, 8, 7, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 8	4 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {3, 5}, {1, 4, 7}} order: 6

See Matrix

$$[4\,y_5 - y_1 + 4\,y_2 - y_3 - y_4,\ y_2,\ y_5,\ y_1,\ y_2,\ y_3,\ y_4,\ 0,\ y_5]$$

$p = -s^2 + s^8$ $p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {5, 7}} order: 4

See Matrix

$$[9\,y_1 - 4\,y_3 - 13\,y_2 + 9\,y_4,\ 4\,y_1,\ 0,\ 4\,y_3,\ 4\,y_2,\ 0,\ 5\,y_1 - 9\,y_2 + 5\,y_4,\ 4\,y_4,\ 0]$$

$p' = -s + s^5$ $p = -s + s^5$

180 . Coloring, {2, 3, 6, 7, 8}

R: [4, 9, 5, 7, 7, 8, 5, 6, 1]
B: [2, 4, 4, 8, 3, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[y_5,\ 0,\ 0,\ y_3,\ y_4,\ y_2,\ -y_5 + y_2 + 4\,y_1,\ y_1,\ -y_3 - y_4 + 4\,y_2 + y_1]$$

$p' = s^4 - s^6$ $p = s^4 - s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1,\ y_2,\ 2\,y_4,\ y_3,\ 0,\ 0,\ y_4,\ y_5,\ 0]$$

$p = -s^2 + s^6$

181 . Coloring, {2, 3, 6, 7, 9}

R: [4, 9, 5, 7, 7, 8, 5, 1, 2]
B: [2, 4, 4, 8, 3, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	6 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {2, 9}} order: 4

See Matrix

$$[y_5, y_3, 0, y_4, y_2, 0, -y_5 + 3\,y_3 + 2\,y_1, 2\,y_3 - y_4 - y_2 + 3\,y_1, y_1]$$

$p' = s^4 - s^6$ $p = -s^4 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 6, 7, 8}} order: 6

See Matrix

$$[y_2 + y_3 - y_4 - y_1 + y_5 + y_6, y_2, y_3, y_4, 0, y_1, y_5, y_6, 0]$$

$p = -s^2 + s^3 - s^4 + s^5 - s^6 + s^7$

182 . Coloring, {2, 3, 6, 8, 9}

R: [4, 9, 5, 7, 7, 8, 1, 6, 2]
B: [2, 4, 4, 8, 3, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 8	6 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}, {2, 9}, {6, 8}} order: 6

See Matrix

$$[4\,y_5 - y_1 - y_2 - y_3 + 4\,y_4, y_5, 0, y_1, y_2, y_4, y_3, y_5, y_4]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$ $p = -s^2 + s^8$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1 + y_2 - y_3 - y_4 + y_5 + y_6, y_1, y_2, y_3, y_4, 0, y_5, y_6, 0]$$

$p = s^4 - s^5 + s^6 - s^7$

183 . Coloring, {2, 3, 7, 8, 9}

R: [4, 9, 5, 7, 7, 7, 5, 6, 2]
B: [2, 4, 4, 8, 3, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	3 *vs* 6	4 *vs* 5

Omega Rank for R : cycles: {{5, 7}, {2, 9}} order: 2

See Matrix

$$[0, 2\,y_1 + 5\,y_2 - 8\,y_3, 0, 3\,y_2, 2\,y_1, 2\,y_2, 8\,y_1 + 20\,y_2 - 30\,y_3, 0, 2\,y_3]$$

$p' = -s^2 + s^4$ $p = -s^2 + s^6$ $p = -s^2 + s^4$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_2, y_3, y_1, -y_2 + y_3 + y_1 + y_4, 0, 0, 0, y_4, 0]$$

$p = -s^2 + s^3 - s^4 + s^5$

184 . Coloring, {2, 4, 5, 6, 7}

R: [4, 9, 4, 8, 3, 8, 5, 1, 1]
B: [2, 4, 5, 7, 7, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[2\,y_3, 0, 2\,y_1, 2\,y_2, 3\,y_5, 0, 0, 2\,y_4, 2\,y_5]$$

$p = -s^3 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1, y_2, 0, y_3, y_4, 2\,y_4, y_5, 0, 0]$$

$p = -s^2 + s^6$

185 . Coloring, {2, 4, 5, 6, 8}

$\Omega p(\Delta)=0$: $p = s^2 + 6s^4 + 16s^7$

R: [4, 9, 4, 8, 3, 8, 1, 6, 1]
B: [2, 4, 5, 7, 7, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	5 *vs* 5

Omega Rank for R : cycles: {{6, 8}} order: 4

See Matrix

$$[y_1, 0, y_5, y_2, 0, y_3, 0, y_4, y_5]$$

$p = -s^4 + s^6$

Omega Rank for B : cycles: {{5, 7}} order: 4

See Matrix

$$[y_4, y_3, 0, y_2, y_1, 0, y_5, 0, 0]$$

186 . Coloring, {2, 4, 5, 6, 9}

R: [4, 9, 4, 8, 3, 8, 1, 1, 2]
B: [2, 4, 5, 7, 7, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	4 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}, {2, 9}} order: 6

See Matrix

$$[y_3, y_1, -y_3 + 5\,y_1 - y_2 - y_4 + 5\,y_5, y_2, 0, 0, 0, y_4, y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1, 3\,y_1 + y_2 + y_4 - y_3, 0, y_2, y_4, 2\,y_1, y_3, 0, 0]$$

$p = -s^4 + s^5$ $p = -s^4 + s^6$

187 . Coloring, {2, 4, 5, 7, 8}

R: [4, 9, 4, 8, 3, 7, 5, 6, 1]
B: [2, 4, 5, 7, 7, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	8 *vs* 8	5 *vs* 6

Omega Rank for R : cycles: {{3, 4, 5, 6, 7, 8}} order: 6

See Matrix

$$[y_5, 0, y_4, y_1, y_2, y_3, y_8, y_7, y_6]$$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1, y_2, 0, y_5, y_4, 0, y_3, y_4, 0]$$

$p = s^2 - s^6$

188 . Coloring, {2, 4, 5, 7, 9}

R: [4, 9, 4, 8, 3, 7, 5, 1, 2]
B: [2, 4, 5, 7, 7, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	7 *vs* 8	5 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {1, 4, 8}} order: 6

See Matrix

$$[5\,y_1 - y_2 - y_3 - y_4 - y_5 - y_6 + 5\,y_7, y_1, y_2, y_3, y_4, 0, y_5, y_6, y_7]$$

$$p = -s^4 - s^5 + s^7 + s^8$$

Omega Rank for B : cycles: {{1, 2, 4, 7}, {6, 8}} order: 4

See Matrix

$$[y_4, y_5, 0, -y_4 - y_3 + 2\,y_2 + 3\,y_1, y_3, y_2, -y_5 + 3\,y_2 + 2\,y_1, y_1, 0]$$

$$p = -s^2 + s^6 \quad p' = -s^2 + s^6$$

189 . Coloring, {2, 4, 5, 8, 9}

R: [4, 9, 4, 8, 3, 7, 1, 6, 2]
B: [2, 4, 5, 7, 7, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	7 *vs* 8	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 6, 7, 8}, {2, 9}}

See Matrix

$$[y_4, y_2, y_3, y_1, 0, -y_4 + 5\,y_2 - y_3 - y_1 - y_5 - y_6 + 5\,y_7, y_5, y_6, y_7]$$

$$p = -s^2 - s^3 + s^7 + s^8$$

Omega Rank for B : cycles: {{5, 7}} order: 6

See Matrix

$$[y_1 - y_2 - y_3 + y_4 + y_5, y_1, 0, y_2, y_3, 0, y_4, y_5, 0]$$

$p = -s^5 + s^6$

190 . Coloring, {2, 4, 6, 7, 8}

R: [4, 9, 4, 8, 7, 8, 5, 6, 1]
B: [2, 4, 5, 7, 3, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[y_1, 0, 0, -14\,y_1 - y_2 + 39\,y_3 - 14\,y_4 - y_5, -5\,y_1 + 14\,y_3 - 5\,y_4, y_2, y_3, y_4, y_5]$$

$p' = s^4 - s^6$ $p = -s^4 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}, {3, 5}} order: 4

See Matrix

$$[y_2, 3\,y_1 + 2\,y_4 - y_3, y_1, -y_2 + 2\,y_1 + 3\,y_4, y_4, 0, y_3, 0, 0]$$

$p = s - s^5$ $p' = -s + s^5$

191 . Coloring, {2, 4, 6, 7, 9}

R: [4, 9, 4, 8, 7, 8, 5, 1, 2]
B: [2, 4, 5, 7, 3, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {2, 9}, {1, 4, 8}} order: 6

See Matrix

$$[y_2, 3\,y_1 - 4\,y_3, 0, -y_2 + 10\,y_1 - y_4 - 10\,y_3, y_1, 0, 4\,y_1 - 5\,y_3, y_4, y_3]$$

$p' = s^2 + s^3 - s^5 - s^6$ $p' = s - s^3 - s^4 + s^6$ $p = s - s^7$

Omega Rank for B : cycles: {{1, 2, 4, 7}, {3, 5}} order: 4

See Matrix

$$[y_4, y_5, y_3, y_2, y_1, -y_4 + 3\,y_3 - y_2 + 2\,y_1, -y_5 + 2\,y_3 + 3\,y_1, 0, 0]$$

$p = -s^2 + s^6$ $p' = s^2 - s^6$

192 . Coloring, {2, 4, 6, 8, 9}

R: [4, 9, 4, 8, 7, 8, 1, 6, 2]
B: [2, 4, 5, 7, 3, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {6, 8}} order: 4

See Matrix

$$[3\,y_1 - y_2 + 2\,y_3, y_1, 0, 2\,y_1 - y_4 - y_5 + 3\,y_3, 0, y_4, y_5, y_2, y_3]$$

$p' = s^4 - s^6$ $p = -s^4 + s^6$

Omega Rank for B : cycles: {{3, 5}} order: 6

See Matrix

$$[y_1 + y_2 - y_3 - y_4 + y_5, y_1, y_2, y_3, y_4, 0, y_5, 0, 0]$$

$p = s^5 - s^6$

193 . Coloring, {2, 4, 7, 8, 9}

R: [4, 9, 4, 8, 7, 7, 5, 6, 2]
B: [2, 4, 5, 7, 3, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {2, 9}} order: 4

See Matrix

$$[0, y_1 + y_2 + y_3 - 4\,y_5, 0, y_1, y_2, y_3, 4\,y_1 + 4\,y_2 + 4\,y_3 - 15\,y_5 - y_4, y_4, y_5]$$

$p' = s^4 - s^6 \quad p = -s^4 + s^6$

Omega Rank for B : cycles: {{3, 5}, {1, 2, 4, 7}} order: 4

See Matrix

$$[y_3, y_4, y_5, -y_3 + 3\,y_5 + 2\,y_2, y_2, 0, -y_4 + 2\,y_5 + 3\,y_2 - y_1, y_1, 0]$$

$p = -s^2 + s^6 \quad p' = -s^2 + s^6$

194 . Coloring, {2, 5, 6, 7, 8}

R: [4, 9, 4, 7, 3, 8, 5, 6, 1]
B: [2, 4, 5, 8, 7, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 8	6 *vs* 6

Omega Rank for R : cycles: {{3, 4, 5, 7}, {6, 8}} order: 4

See Matrix

$$[-y_2 + y_5 - y_3 + 4\,y_4, 0, y_2, y_1, -y_1 + 4\,y_5 + y_4 - y_6, y_5, y_3, y_4, y_6]$$

$p = -s^3 + s^7 \quad p' = -s^3 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1, y_2, 0, y_3, y_5, 0, y_4, y_6, 0]$$

195 . Coloring, {2, 5, 6, 7, 9}

R: [4, 9, 4, 7, 3, 8, 5, 1, 2]
B: [2, 4, 5, 8, 7, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 8	6 *vs* 7

Omega Rank for R : cycles: {{2, 9}, {3, 4, 5, 7}} order: 4

See Matrix

$$[y_4, y_5, y_2, y_3, 2\,y_5 - y_3 - y_6 + 3\,y_1, 0, -y_4 + 3\,y_5 - y_2 + 2\,y_1, y_6, y_1]$$

$p' = -s^3 + s^7$ $p = -s^3 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 6, 7, 8}} order: 6

See Matrix

$$[y_1, y_1 + y_6 + y_5 + y_3 - y_4 - y_2, 0, y_6, y_5, y_3, y_4, y_2, 0]$$

$p = s^2 - s^3 + s^4 - s^5 + s^6 - s^7$

196 . Coloring, {2, 5, 6, 8, 9}

R: [4, 9, 4, 7, 3, 8, 1, 6, 2]
B: [2, 4, 5, 8, 7, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 8	4 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {6, 8}, {1, 4, 7}} order: 6

See Matrix

$$[y_4, y_3, y_2, y_1, 0, y_5, -y_4 + 4\,y_3 - y_2 - y_1 + 4\,y_5, y_3, y_5]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = -s^2 + s^8$ $p' = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {5, 7}} order: 4

See Matrix

$$[2\,y_3,\ 9\,y_3 + 9\,y_2 - 11\,y_1 - 2\,y_4,\ 0,\ 2\,y_2,\ 7\,y_3 + 7\,y_2 - 9\,y_1,\ 0,\ 2\,y_1,\ 2\,y_4,\ 0]$$

$p' = -s + s^5$ $p = -s + s^5$

197 . Coloring, {2, 5, 7, 8, 9}

R: [4, 9, 4, 7, 3, 7, 5, 6, 2]
B: [2, 4, 5, 8, 7, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{3, 4, 5, 7}, {2, 9}} order: 4

See Matrix

$$[0,\ -4\,y_5 + y_1 + y_2 + y_3,\ -15\,y_5 + 4\,y_1 + 4\,y_2 + 4\,y_3 - y_4,\ y_1,\ y_2,\ y_3,\ y_4,\ 0,\ y_5]$$

$p' = -s^2 + s^6$ $p = -s^2 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1 - y_2 - y_3 + y_4 + y_5,\ y_1,\ 0,\ y_2,\ y_3,\ 0,\ y_4,\ y_5,\ 0]$$

$p = -s^3 + s^4 - s^5 + s^6$

198 . Coloring, {2, 6, 7, 8, 9}

R: [4, 9, 4, 7, 7, 8, 5, 6, 2]
B: [2, 4, 5, 8, 3, 7, 1, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	3 *vs* 7	5 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {2, 9}, {6, 8}} order: 2

See Matrix

$$[0, y_2, 0, y_2 - y_1 + 3\,y_3, y_1, y_3, 3\,y_2 + y_3, y_2, y_3]$$

$p = -s^2 + s^4$ $p' = -s^2 + s^4$ $p = -s^2 + s^6$ $p' = -s^2 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {3, 5}} order: 4

See Matrix

$$[3\,y_1 - y_2 + 2\,y_3, 2\,y_1 + 3\,y_3 - y_4 - y_5, y_1, y_2, y_3, 0, y_4, y_5, 0]$$

$p = s^2 - s^6$ $p' = -s^2 + s^6$

199 . Coloring, {3, 4, 5, 6, 7}

$\Omega p(\Delta)=0$: $p = -s^2 + 6s^4 - 16s^7$

R: [4, 4, 5, 8, 3, 8, 5, 1, 1]
B: [2, 9, 4, 7, 7, 7, 1, 6, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 5	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}, {3, 5}} order: 6

See Matrix

$$[y_3, 0, y_4, y_1, y_2, 0, 0, -y_3 + 2\,y_4 - y_1 + 2\,y_2, 0]$$

$p = -s - s^2 + s^4 + s^5$

Omega Rank for B : cycles: {{2, 9}} order: 4

See Matrix

$$[y_1, y_3, 0, y_2, 0, 2\,y_2, y_5, 0, y_4]$$

$p = -s^4 + s^6$

200 . Coloring, {3, 4, 5, 6, 8}

R: [4, 4, 5, 8, 3, 8, 1, 6, 1]
B: [2, 9, 4, 7, 7, 7, 5, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	3 *vs* 6

Omega Rank for R : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[3\,y_1 + 2\,y_2 - y_4,\ 0,\ y_1,\ 2\,y_1 + 3\,y_2 - y_3,\ y_2,\ y_3,\ 0,\ y_4,\ 0]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$

Omega Rank for B : cycles: {{5, 7}, {2, 9}} order: 2

See Matrix

$$[4\,y_2,\ 2\,y_3,\ 0,\ 2\,y_2,\ 2\,y_1,\ 0,\ -2\,y_2 - 2\,y_1 + 5\,y_3,\ 0,\ 2\,y_3 - 4\,y_2]$$

$p = -s^2 + s^4$ $p' = -s^2 + s^4$ $p = -s^2 + s^6$

201 . Coloring, {3, 4, 5, 6, 9}

R: [4, 4, 5, 8, 3, 8, 1, 1, 2]
B: [2, 9, 4, 7, 7, 7, 5, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	4 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}, {3, 5}} order: 6

See Matrix

$$[-y_1 + 5\,y_2 - y_3 + 5\,y_4 - y_5,\ y_1,\ y_2,\ y_3,\ y_4,\ 0,\ 0,\ y_5,\ 0]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 9}, {5, 7}} order: 6

See Matrix

$$[y_2, -y_2 + y_3 - y_4, 0, y_1, -3\,y_1 + y_3, 2\,y_1, y_3, 0, y_4]$$

$p = -s^2 + s^5$ $p' = -s^2 + s^5$ $p' = -s^3 + s^6$

202 . Coloring, {3, 4, 5, 7, 8}

R: [4, 4, 5, 8, 3, 7, 5, 6, 1]
B: [2, 9, 4, 7, 7, 8, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	7 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{3, 5}} order: 6

See Matrix

$$[y_1, 0, y_4, y_2, y_3, y_7, y_5, y_6, 0]$$

Omega Rank for B : cycles: {{2, 9}} order: 4

See Matrix

$$[y_5, y_4, 0, y_3, 0, 0, y_2, y_3, y_1]$$

$p = -s^4 + s^6$

203 . Coloring, {3, 4, 5, 7, 9}

R: [4, 4, 5, 8, 3, 7, 5, 1, 2]
B: [2, 9, 4, 7, 7, 8, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	6 *vs* 7

Omega Rank for R : cycles: {{1, 4, 8}, {3, 5}} order: 6

See Matrix

$$[4\,y_4,\ 7\,y_4 - 11\,y_3 + 7\,y_1 - 11\,y_2 + 7\,y_5,\ 4\,y_3,\ 4\,y_1,\ 4\,y_2,\ 0,\ 7\,y_4 - 11\,y_3 + 7\,y_1 - 11\,y_2 + 7\,y_5,\ 4\,y_5,\ 0]$$

$p' = s^2 + s^3 - s^5 - s^6 \quad p = s^2 - s^4 - s^5 + s^7$

Omega Rank for B : cycles: {{6, 8}, {1, 2, 9}} order: 6

See Matrix

$$[-y_1 - y_2 + 5\,y_3 - y_4 + 5\,y_5 - y_6,\ y_1,\ 0,\ y_2,\ 0,\ y_3,\ y_4,\ y_5,\ y_6]$$

$p = s^3 + s^4 - s^6 - s^7$

204 . Coloring, {3, 4, 5, 8, 9}

R: [4, 4, 5, 8, 3, 7, 1, 6, 2]
B: [2, 9, 4, 7, 7, 8, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	7 *vs* 8	3 *vs* 7

Omega Rank for R : cycles: {{3, 5}, {1, 4, 6, 7, 8}}

See Matrix

$$[-y_1 + 5\,y_2 - y_3 + 5\,y_4 - y_5 - y_6 - y_7,\ y_1,\ y_2,\ y_3,\ y_4,\ y_5,\ y_6,\ y_7,\ 0]$$

$p = -s^2 - s^3 + s^7 + s^8$

Omega Rank for B : cycles: {{5, 7}, {1, 2, 9}} order: 6

See Matrix

$$[y_1 + y_3,\ y_1 + y_3,\ 0,\ y_1,\ 2\,y_1 + 3\,y_3 - y_2,\ 0,\ y_2,\ y_1,\ y_3\ ]$$

$p = -s^2 + s^4 \quad p' = -s^2 + s^4 \quad p = -s^2 + s^6 \quad p' = -s^2 + s^6$

205 . Coloring, {3, 4, 6, 7, 8}

$\Omega p(\Delta)=0: \quad p = -s^3 + s^4 + 4s^5 - 8s^7$

R: [4, 4, 5, 8, 7, 8, 5, 6, 1]
B: [2, 9, 4, 7, 3, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 6	6 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[3\,y_1 - 4\,y_4 + 3\,y_2 - y_3, 0, 0, y_1, y_4, y_2, 2\,y_1 - 3\,y_4 + 2\,y_2, y_3, 0]$$

$p' = s^3 - s^5$ $p = -s^3 + s^5$

Omega Rank for B : cycles: {{2, 9}} order: 6

See Matrix

$$[y_4, y_1, y_2, y_3, 0, 0, y_5, 0, y_6]$$

206 . Coloring, {3, 4, 6, 7, 9}

Ωp(Δ)=0: $p' = s^2 + 4s^4 + 4s^5 + 8s^6$ $p = s^2 + 4s^4 + 4s^5 + 8s^6$

R: [4, 4, 5, 8, 7, 8, 5, 1, 2]
B: [2, 9, 4, 7, 3, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
5 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	4 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {1, 4, 8}} order: 6

See Matrix

$$[y_3, y_2, 0, -y_3 - y_2 + 2\,y_1 + 2\,y_5 - y_4, y_1, 0, y_5, y_4, 0]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 9}} order: 6

See Matrix

$$[-y_3 + y_2 + y_4, y_1, y_3, -y_1 - y_3 + y_2 + y_4, 0, y_3, y_2, 0, y_4]$$

$p = -s^4 + s^5$ $p = -s^4 + s^6$ $p = -s^4 + s^7$

207 . Coloring, {3, 4, 6, 8, 9}

R: [4, 4, 5, 8, 7, 8, 1, 6, 2]
B: [2, 9, 4, 7, 3, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	6 *vs* 7

Omega Rank for R : cycles: {{6, 8}} order: 6

See Matrix

$$[y_5 - 2\,y_4 + y_3 + y_2 - y_1, y_4, 0, y_5, y_4, y_3, y_2, y_1, 0]$$

$p = -s^5 + s^6$ $p = -s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 4, 5, 7}}

See Matrix

$$[4\,y_2, 4\,y_3, 5\,y_2 + 5\,y_3 - 4\,y_1 - 4\,y_4 - 4\,y_5 + 5\,y_6, 4\,y_1, 4\,y_4, 0, 4\,y_5, 0, 4\,y_6]$$

$p = -s - s^2 - s^3 + s^5 + s^6 + s^7$

208 . Coloring, {3, 4, 7, 8, 9}

R: [4, 4, 5, 8, 7, 7, 5, 6, 2]
B: [2, 9, 4, 7, 3, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 6	6 *vs* 7

Omega Rank for R : cycles: {{5, 7}} order: 6

See Matrix

$$[0, y_1, 0, y_3, y_4, y_2, y_5, y_6, 0]$$

Omega Rank for B : cycles: {{1, 2, 9}} order: 6

See Matrix

$$[y_1, y_2, 2\,y_6, y_3, 0, 0, y_4, y_6, y_5]$$

$p = -s^4 + s^7$

209 . Coloring, {3, 5, 6, 7, 8}

R: [4, 4, 5, 7, 3, 8, 5, 6, 1]
B: [2, 9, 4, 8, 7, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[y_1, 0, -y_1 + y_3 - y_2 + 4\,y_5, y_4, 4\,y_3 + y_5 - y_4, y_3, y_2, y_5, 0]$$

$p = s^4 - s^6$ $p' = s^4 - s^6$

Omega Rank for B : cycles: {{2, 9}} order: 4

See Matrix

$$[y_3, y_2, 0, y_1, 0, 0, 3\,y_1, y_5, y_4]$$

$p = s^4 - s^6$

210 . Coloring, {3, 5, 6, 7, 9}

R: [4, 4, 5, 7, 3, 8, 5, 1, 2]
B: [2, 9, 4, 8, 7, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 7	7 *vs* 7

Omega Rank for R : cycles: {{3, 5}} order: 6

See Matrix

$$[y_4, y_5, y_6, y_3, y_1, 0, y_2, y_5, 0]$$

$p = -s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 9}} order: 6

See Matrix

$$[y_6, y_7, 0, y_4, 0, y_5, y_1, y_2, y_3]$$

211 . Coloring, {3, 5, 6, 8, 9}

R: [4, 4, 5, 7, 3, 8, 1, 6, 2]
B: [2, 9, 4, 8, 7, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 9	9 *vs* 9	5 *vs* 8	5 *vs* 7

Omega Rank for R : cycles: {{1, 4, 7}, {3, 5}, {6, 8}} order: 6

See Matrix

$$[-y_1 + 4y_3 - y_2 + 4y_5 - y_4, y_1, y_3, y_2, y_5, y_3, y_4, y_5, 0]$$

$p = -s^2 - s^3 + s^5 + s^6 \quad p = s^2 - s^4 - s^5 + s^7 \quad p = -s^2 + s^8$

Omega Rank for B : cycles: {{1, 2, 9}, {5, 7}} order: 6

See Matrix

$$[-y_1 - y_2 + 4y_3 - y_4 - y_5, y_1, 0, y_2, y_3, 0, y_3, y_4, y_5]$$

$p = -s^3 + s^6 \quad p' = -s^3 + s^6$

212 . Coloring, {3, 5, 7, 8, 9}

R: [4, 4, 5, 7, 3, 7, 5, 6, 2]
B: [2, 9, 4, 8, 7, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{3, 5}} order: 4

See Matrix

$$[0, y_4, y_5, y_1, y_2, 2\,y_4, y_3, 0, 0]$$

$p = -s^4 + s^6$

Omega Rank for B : cycles: {{1, 2, 9}} order: 3

See Matrix

$$[y_3, y_2, 0, y_1, 0, 0, 2\,y_1, y_5, y_4]$$

$p = s^3 - s^6$

213 . Coloring, {3, 6, 7, 8, 9}

R: [4, 4, 5, 7, 7, 8, 5, 6, 2]
B: [2, 9, 4, 8, 3, 7, 1, 1, 1]

See graph

See pair graph

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	4 *vs* 6	6 *vs* 7

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[0, y_2 - y_3 + 4\,y_4, 0, -y_1 + 4\,y_2 + y_4, y_1, y_2, y_3, y_4, 0]$$

$p' = s^3 - s^5$ $p = -s^3 + s^5$

Omega Rank for B : cycles: {{1, 2, 9}} order: 6

See Matrix

$$[y_3, y_1, 2\,y_6, y_2, 0, 0, y_6, y_5, y_4]$$

$p = -s^4 + s^7$

214 . Coloring, {4, 5, 6, 7, 8}

R: [4, 4, 4, 8, 3, 8, 5, 6, 1]
B: [2, 9, 5, 7, 7, 7, 1, 1, 2]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 5

Omega Rank for R : cycles: {{6, 8}} order: 4

See Matrix

$$[y_1, 0, y_2, y_3, 3\,y_1, y_4, 0, y_5, 0]$$

$$p = -s^4 + s^6$$

Omega Rank for B : cycles: {{2, 9}} order: 4

See Matrix

$$[y_1, y_3, 0, 0, y_2, 0, y_4, 0, y_5]$$

215 . Coloring, {4, 5, 6, 7, 9}

R: [4, 4, 4, 8, 3, 8, 5, 1, 2]
B: [2, 9, 5, 7, 7, 7, 1, 6, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{1, 4, 8}} order: 3

See Matrix

$$[y_1, y_2, y_3, y_4, 3\,y_2, 0, 0, y_5, 0]$$

$$p = -s^3 + s^6$$

Omega Rank for B : cycles: {{1, 2, 9}} order: 3

See Matrix

$$[y_1, y_2, 0, 0, y_3, 2\,y_3, y_4, 0, y_5]$$

$p = -s^3 + s^6$

216 . Coloring, {4, 5, 6, 8, 9}

R: [4, 4, 4, 8, 3, 8, 1, 6, 2]
B: [2, 9, 5, 7, 7, 7, 5, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	4 *vs* 5

Omega Rank for R : cycles: {{6, 8}} order: 4

See Matrix

$$[3\,y_2, y_2, 2\,y_2, y_1, 0, y_4, 0, y_3, 0]$$

$p' = s^3 - s^5$ $p = s^3 - s^5$

Omega Rank for B : cycles: {{5, 7}, {1, 2, 9}} order: 6

See Matrix

$$[4\,y_3, 4\,y_2, 0, 0, 4\,y_1, 0, 5\,y_3 + 5\,y_2 - 4\,y_1 + 5\,y_4, 0, 4\,y_4]$$

$p = -s - s^2 + s^4 + s^5$

217 . Coloring, {4, 5, 7, 8, 9}

R: [4, 4, 4, 8, 3, 7, 5, 6, 2]
B: [2, 9, 5, 7, 7, 8, 1, 1, 1]

See graph

See pair graph

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	7 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{3, 4, 5, 6, 7, 8}} order: 6

See Matrix

$$[0, y_1, y_7, y_5, y_6, y_4, y_2, y_3, 0]$$

Omega Rank for B : cycles: {{1, 2, 9}} order: 3

See Matrix

$$[y_1, y_2, 0, 0, y_4, 0, y_3, y_4, y_5]$$

$$p = -s^3 + s^6$$

218 . Coloring, {4, 6, 7, 8, 9}

R: [4, 4, 4, 8, 7, 8, 5, 6, 2]
B: [2, 9, 5, 7, 3, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[0, y_1, 0, -14\,y_1 - y_2 + 39\,y_3 - 14\,y_4, -5\,y_1 + 14\,y_3 - 5\,y_4, y_2, y_3, y_4, 0]$$

$$p = -s^3 + s^5 \quad p' = -s^3 + s^5$$

Omega Rank for B : cycles: {{1, 2, 9}, {3, 5}} order: 6

See Matrix

$$[-y_1 + 5\,y_2 + 5\,y_3 - y_4 - y_5, y_1, y_2, 0, y_3, 0, y_4, 0, y_5]$$

$$p = -s^2 - s^3 + s^5 + s^6$$

219 . Coloring, {5, 6, 7, 8, 9}

R: [4, 4, 4, 7, 3, 8, 5, 6, 2]
B: [2, 9, 5, 8, 7, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{3, 4, 5, 7}, {6, 8}} order: 4

See Matrix

$$[0, y_2, y_3, y_1, -y_1 + 4\,y_2 + 4\,y_3 + 4\,y_4 - 15\,y_5, y_2 + y_3 + y_4 - 4\,y_5, y_4, y_5, 0]$$

$p = -s^2 + s^6$ $p' = -s^2 + s^6$

Omega Rank for B : cycles: {{1, 2, 9}} order: 3

See Matrix

$$[y_1, y_2, 0, 0, y_3, 0, y_4, 3\,y_3, y_5]$$

$p = -s^3 + s^6$

220 . Coloring, {2, 3, 4, 5, 6, 7}

Ωp(Δ)=0: $p = s^3 + s^4 - 4s^5 - 8s^7$

R: [4, 9, 5, 8, 3, 8, 5, 1, 1]
B: [2, 4, 4, 7, 7, 7, 1, 6, 2]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	5 *vs* 5

Omega Rank for R : cycles: {{1, 4, 8}, {3, 5}} order: 6

See Matrix

$$[2\,y_1 - y_2 + 2\,y_3 - y_4 - y_5, 0, y_1, y_2, y_3, 0, 0, y_4, y_5]$$

$p = s^2 + s^3 - s^5 - s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1, y_2, 0, y_5, 0, y_3, y_4, 0, 0]$$

221 . Coloring, {2, 3, 4, 5, 6, 8}

R: [4, 9, 5, 8, 3, 8, 1, 6, 1]
B: [2, 4, 4, 7, 7, 7, 5, 1, 2]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	5 *vs* 5

Omega Rank for R : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[y_3, 0, y_4, y_5, y_2, 2\,y_4 - y_5 + 3\,y_2 - y_1, 0, -y_3 + 3\,y_4 + 2\,y_2, y_1]$$

$p = -s^4 + s^6$ $p' = -s^4 + s^6$

Omega Rank for B : cycles: {{5, 7}} order: 4

See Matrix

$$[y_1, y_2, 0, y_3, y_4, 0, y_5, 0, 0]$$

222 . Coloring, {2, 3, 4, 5, 6, 9}

R: [4, 9, 5, 8, 3, 8, 1, 1, 2]
B: [2, 4, 4, 7, 7, 7, 5, 6, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {3, 5}, {1, 4, 8}} order: 6

See Matrix

$$[y_4, y_3, y_2, y_1, y_3, 0, 0, -y_4 + 4\,y_3 + 4\,y_2 - y_1, y_2]$$

$p = s - s^7$ $p' = s^2 + s^3 - s^5 - s^6$ $p' = s - s^3 - s^4 + s^6$

Omega Rank for B : cycles: {{5, 7}} order: 4

See Matrix

$$[y_4, y_3, 0, y_2, y_1, 2\,y_4, 3\,y_4 - y_3 + y_2 + y_1, 0, 0]$$

$p = -s^4 + s^5$ $p = -s^4 + s^6$

223 . Coloring, {2, 3, 4, 5, 7, 8}

R: [4, 9, 5, 8, 3, 7, 5, 6, 1]
B: [2, 4, 4, 7, 7, 8, 1, 1, 2]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	8 *vs* 8	5 *vs* 5

Omega Rank for R : cycles: {{3, 5}} order: 8

See Matrix

$$[y_1, 0, y_2, y_3, y_4, y_5, y_6, y_7, y_8]$$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_4, y_3, 0, y_2, 0, 0, y_1, y_5, 0]$$

224 . Coloring, {2, 3, 4, 5, 7, 9}

R: [4, 9, 5, 8, 3, 7, 5, 1, 2]
B: [2, 4, 4, 7, 7, 8, 1, 6, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 8	4 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {1, 4, 8}, {3, 5}} order: 6

See Matrix

$$[2\,y_5, 2\,y_1, 2\,y_3, 2\,y_4, -7\,y_1 + 5\,y_3 + 5\,y_2, 0, 2\,y_2, -2\,y_5 - 8\,y_1 + 8\,y_3 - 2\,y_4 + 8\,y_2, -5\,y_1 + 3\,y_3 + 3\,y_2]$$

$p = -s^2 - s^3 + s^5 + s^6$ $p = s^2 - s^4 - s^5 + s^7$ $p = -s^2 + s^8$

Omega Rank for B : cycles: {{1, 2, 4, 7}, {6, 8}} order: 4

See Matrix

$$[y_3, y_2, 0, -y_3 + 2\,y_1 + 3\,y_4, 0, y_1, -y_2 + 3\,y_1 + 2\,y_4, y_4, 0]$$

$p' = -s + s^5$ $p = -s + s^5$

225 . Coloring, {2, 3, 4, 5, 8, 9}

R: [4, 9, 5, 8, 3, 7, 1, 6, 2]
B: [2, 4, 4, 7, 7, 8, 5, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	8 *vs* 9	6 *vs* 9	5 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {3, 5}, {1, 4, 6, 7, 8}}

See Matrix

$$[4\,y_2 + 4\,y_6 - y_1 - y_3 - y_4 - y_5, y_2, y_6, y_1, y_2, y_3, y_4, y_5, y_6]$$

$p' = s^2 + s^3 - s^7 - s^8$ $p' = s + s^2 - s^6 - s^7$ $p' = 1 - s^2 - s^5 + s^7$

Omega Rank for B : cycles: {{5, 7}} order: 6

See Matrix

$$[y_4, y_5, 0, y_3, y_2, 0, y_4 - y_5 + y_3 + y_2 - y_1, y_1, 0]$$

$p = s^5 - s^6$

226 . Coloring, {2, 3, 4, 6, 7, 8}

Ωp(Δ)=0: $p = s^2 - 2s^4 - 16s^7$

R: [4, 9, 5, 8, 7, 8, 5, 6, 1]
B: [2, 4, 4, 7, 3, 7, 1, 1, 2]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 7	5 *vs* 5

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[y_1, 0, 0, 3\,y_1 - y_2 - 4\,y_3 + 3\,y_4 - y_5, 2\,y_1 - 3\,y_3 + 2\,y_4, y_2, y_3, y_4, y_5]$$

$p = -s^4 + s^6$ $p' = s^4 - s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1, y_2, y_3, y_4, 0, 0, y_5, 0, 0]$$

227 . Coloring, {2, 3, 4, 6, 7, 9}

R: [4, 9, 5, 8, 7, 8, 5, 1, 2]
B: [2, 4, 4, 7, 3, 7, 1, 6, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {1, 4, 8}, {2, 9}} order: 6

See Matrix

$$[y_4, y_3, 0, y_2, 2\,y_1, 0, 2\,y_3, -y_4 + 3\,y_3 - y_2 + 3\,y_1, y_1]$$

$p = -s + s^3 + s^4 - s^6$ $p' = -s - s^2 + s^4 + s^5$ $p = -s + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1, y_1 + y_3 - y_2, y_4, y_3, 0, y_4, y_2, 0, 0]$$

$p = s^2 - s^6$ $p' = s^2 - s^3 + s^4 - s^5$

228 . Coloring, {2, 3, 4, 6, 8, 9}

R: [4, 9, 5, 8, 7, 8, 1, 6, 2]
B: [2, 4, 4, 7, 3, 7, 5, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 8	5 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {6, 8}} order: 6

See Matrix

$$[2\,y_1 - y_2 - y_5 + 3\,y_6,\ y_1,\ 0,\ 3\,y_1 - y_3 - y_4 + 2\,y_6,\ y_2,\ y_3,\ y_4,\ y_5,\ y_6]$$

$p = s^5 - s^7$ $p' = -s^5 + s^7$

Omega Rank for B : cycles: {{3, 4, 5, 7}} order: 4

See Matrix

$$[y_1 + y_2 - y_3 - y_4 + y_5,\ y_1,\ y_2,\ y_3,\ y_4,\ 0,\ y_5,\ 0,\ 0]$$

$p = -s^3 + s^4 - s^5 + s^6$

229 . Coloring, {2, 3, 4, 7, 8, 9}

R: [4, 9, 5, 8, 7, 7, 5, 6, 2]
B: [2, 4, 4, 7, 3, 8, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {2, 9}} order: 4

See Matrix

$$[0,\ y_5,\ 0,\ y_3,\ y_4,\ -15\,y_5 - y_3 - y_4 + 4\,y_1 + 4\,y_2,\ y_1,\ y_2,\ -4\,y_5 + y_1 + y_2]$$

$p = s^4 - s^6$ $p' = s^4 - s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_4, y_3, 2\,y_1, y_2, 0, 0, y_4 - y_3 + y_2 - 3\,y_1, y_1, 0]$$

$p' = s^2 - s^3 + s^4 - s^5 \quad p = s^2 - s^6$

230 . Coloring, {2, 3, 5, 6, 7, 8}

R: [4, 9, 5, 7, 3, 8, 5, 6, 1]
B: [2, 4, 4, 8, 7, 7, 1, 1, 2]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	6 *vs* 8	5 *vs* 5

Omega Rank for R : cycles: {{3, 5}, {6, 8}} order: 6

See Matrix

$$[-y_1 + y_3 - y_4 + 4\,y_5, 0, y_1, -y_2 + 4\,y_3 + y_5 - y_6, y_2, y_3, y_4, y_5, y_6]$$

$p = -s^5 + s^7 \quad p' = -s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1, y_2, 0, y_3, 0, 0, y_4, y_5, 0]$$

231 . Coloring, {2, 3, 5, 6, 7, 9}

R: [4, 9, 5, 7, 3, 8, 5, 1, 2]
B: [2, 4, 4, 8, 7, 7, 1, 6, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 8	5 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {3, 5}} order: 6

See Matrix

$$[y_2, y_1, -y_2 + 3\,y_1 - y_5 + 2\,y_4, 2\,y_1 - y_6 - y_3 + 3\,y_4, y_6, 0, y_5, y_3, y_4]$$

$p' = s^5 - s^7$ $p = s^5 - s^7$

Omega Rank for B : cycles: {{1, 2, 4, 6, 7, 8}} order: 6

See Matrix

$$[y_1 - y_5 - y_4 + y_3 + y_2, y_1, 0, y_5, 0, y_4, y_3, y_2, 0]$$

$p = - s + s^2 - s^3 + s^4 - s^5 + s^6$

232 . Coloring, {2, 3, 5, 6, 8, 9}

Ωp(Δ)=0: $p = s - 64s^7$ $p' = s + 32s^6$ $p' = s^2 - 16s^6$ $p' = s^3 + 8s^6$ $p' = s^4 - 4s^6$ $p' = s^5 + 2s^6$

R: [4, 9, 5, 7, 3, 8, 1, 6, 2]
B: [2, 4, 4, 8, 7, 7, 5, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
1 *vs* 7	2 *vs* 9	2 *vs* 9	2 *vs* 9	1 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {3, 5}, {6, 8}, {1, 4, 7}} order: 6

See Matrix

$$[y_1 + y_2, y_1, y_2, y_1 + y_2, y_1, y_2, y_1 + y_2, y_1, y_2]$$

$p' = - 1 + s^8$ $p' = - 1 + s^2$ $p' = - s + s^3$ $p' = - 1 + s^4$ $p' = - s + s^5$ $p' = - 1 + s^6$ $p' = - s + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}, {5, 7}} order: 4

See Matrix

$$[y_1, y_1, 0, y_1, y_1, 0, y_1, y_1, 0]$$

$p' = - s^2 + s^5$ $p = s - s^3$ $p' = - s^2 + s^3$ $p' = - s^2 + s^4$ $p' = s - s^2$

` See 6-level graph

`

M \; N

$ [[0, 8, 4, 15, 8, 4, 15, 8, 4] , [8, 0, 0, 8, 10, 0, 8, 10, 0] , [4, 0, 0, 4, 0, 5, 4, 0, 5] , [15, 8, 4, 0, 8, 4, 15, 8, 4] , [8, 10, 0, 8, 0, 0, 8, 10, 0] , [4, 0, 5, 4, 0, 0, 4, 0, 5] , [15, 8, 4, 15, 8, 4, 0, 8, 4] , [8, 10, 0, 8, 10, 0, 8, 0, 0] , [4, 0, 5, 4, 0, 5, 4, 0, 0]] $ $ [[0, 3, 3, 3, 3, 3, 3, 3, 3] , [3, 0, 1, 3, 3, 2, 3, 3, 3] , [3, 1, 0, 3, 3, 3, 3, 2, 3] , [3, 3, 3, 0, 3, 3, 3, 3, 3] , [3, 3, 3, 0, 1, 3, 3, 2] , [3, 2, 3, 3, 1, 0, 3, 3, 3] , [3, 3, 3, 3, 3, 3, 0, 3, 3] , [3, 3, 2, 3, 3, 3, 3, 0, 1] , [3, 3, 3, 3, 2, 3, 3, 1, 0]] $

τ= 15 , r'= 5/6

R: [4, 9, 5, 7, 3, 8, 1, 6, 2]
B: [2, 4, 4, 8, 7, 7, 5, 1, 1]

Ranges

Action of R on ranges, [[2], [1]]
Action of B on ranges, [[1], [1]]

Cycles: R , {{2, 9}, {3, 5}, {6, 8}, {1, 4, 7}}, B , {{1, 2, 4, 8}, {5, 7}}

β({1, 2, 4, 5, 7, 8}) = 2/3
β({1, 3, 4, 6, 7, 9}) = 1/3

Partitions

Action of R on partitions, [[2], [1]]
Action of B on partitions, [[2], [2]]

α([{1}, {2, 6}, {4}, {7}, {3, 8}, {5, 9}]) = 1/3
α([{1}, {4}, {8, 9}, {2, 3}, {7}, {5, 6}]) = 2/3

b1 = {1} ` , ` b2 = {2, 6} ` , ` b3 = {4} ` , ` b4 = {8, 9} ` , ` b5 = {2, 3} ` , ` b6 = {7} ` , ` b7 = {5, 6} ` , ` b8 = {3, 8} ` , ` b9 = {5, 9}

Action of R and B on the blocks of the partitions: = [6, 4, 1, 2, 9, 3, 8, 7, 5] [4, 1, 5, 3, 1, 7, 6, 3, 6]
with invariant measure [3, 1, 3, 2, 2, 3, 2, 1, 1]

N by blocks, check: true . ` See partition graph.

` ` See level-6 partition graph.

`

Sandwich	
Coloring	{2, 3, 5, 6, 8, 9}
Rank	6
R,B	[4, 9, 5, 7, 3, 8, 1, 6, 2], [2, 4, 4, 8, 7, 7, 5, 1, 1]
π_2	[8, 4, 15, 8, 4, 15, 8, 4, 0, 8, 10, 0, 8, 10, 0, 4, 0, 5, 4, 0, 5, 8, 4, 15, 8, 4, 0, 8, 10, 0, 4, 0, 5, 8, 4, 0]
u_2	[3, 3, 3, 3, 3, 3, 3, 3, 1, 3, 3, 2, 3, 3, 3, 3, 3, 3, 3, 2, 3, 3, 3, 3, 3, 3, 1, 3, 3, 2, 3, 3, 3, 3, 3, 1] (dim 2)
wpp	[1, 2, 2, 1, 2, 2, 1, 2, 2]
π_6	[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]

u_6	[0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 3, 2, 0, 2, 2, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 2, 2, 0, 2, 3, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]

233 . Coloring, {2, 3, 5, 7, 8, 9}

R: [4, 9, 5, 7, 3, 7, 5, 6, 2]
B: [2, 4, 4, 8, 7, 8, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 7	4 *vs* 5

Omega Rank for R : cycles: {{2, 9}, {3, 5}} order: 4

See Matrix

$$[0, 2 y_4, 2 y_3, 3 y_2, -30 y_4 - 5 y_2 + 8 y_3 + 8 y_1, 2 y_2, 2 y_1, 0, -8 y_4 + 2 y_3 + 2 y_1]$$

$p = - s^3 + s^5$ $p' = - s^3 + s^5$ $p = - s^3 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_2, y_1, 0, -y_2 + y_1 + y_4 + y_3, 0, 0, y_4, y_3, 0]$$

$p = s^2 - s^3 + s^4 - s^5$

234 . Coloring, {2, 3, 6, 7, 8, 9}

R: [4, 9, 5, 7, 7, 8, 5, 6, 2]
B: [2, 4, 4, 8, 3, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	9 *vs* 9	9 *vs* 9	3 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {5, 7}, {6, 8}} order: 2

See Matrix

$$[0, y_3, 0, y_3 - y_1 + 3\,y_2, y_1, y_2, 3\,y_3 + y_2, y_3, y_2]$$

$p' = -s^2 + s^4$ $p = -s^2 + s^4$ $p = -s^2 + s^6$ $p' = -s^2 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1 - y_2 + 3\,y_3 + y_4, y_1, 2\,y_3, y_2, 0, 0, y_3, y_4, 0]$$

$p = -s^2 + s^6$ $p = s^2 - s^3 + s^4 - s^5$

235 . Coloring, {2, 4, 5, 6, 7, 8}

R: [4, 9, 4, 8, 3, 8, 5, 6, 1]
B: [2, 4, 5, 7, 7, 7, 1, 1, 2]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 7	5 *vs* 5

Omega Rank for R : cycles: {{6, 8}} order: 4

See Matrix

$$[y_2, 0, y_1, y_5, -9\,y_2 + 6\,y_1, y_4, 0, y_3, -6\,y_2 + 4\,y_1]$$

$p = -s^4 + s^6$ $p' = -s^4 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1, y_2, 0, y_3, y_4, 0, y_5, 0, 0]$$

236 . Coloring, {2, 4, 5, 6, 7, 9}

R: [4, 9, 4, 8, 3, 8, 5, 1, 2]
B: [2, 4, 5, 7, 7, 7, 1, 6, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	7 *vs* 7	7 *vs* 7	6 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {1, 4, 8}} order: 6

See Matrix

$$[y_3, y_2, y_1, -y_3 + 5\,y_2 - y_1 - y_6 - y_4 + 5\,y_5, y_6, 0, 0, y_4, y_5]$$

$p = -s^3 - s^4 + s^6 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1 - y_2 - 3\,y_3 + y_4, y_1, 0, y_2, y_3, 2\,y_3, y_4, 0, 0]$$

$p = -s^2 + s^6$ $p = -s^2 + s^3 - s^4 + s^5$

237 . Coloring, {2, 4, 5, 6, 8, 9}

R: [4, 9, 4, 8, 3, 8, 1, 6, 2]
B: [2, 4, 5, 7, 7, 7, 5, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 7	4 *vs* 5

Omega Rank for R : cycles: {{2, 9}, {6, 8}} order: 4

See Matrix

$$[3\,y_1, 5\,y_1 + 2\,y_4 - 8\,y_3, 2\,y_1, 2\,y_2, 0, -2\,y_2 - 30\,y_3 + 20\,y_1 + 8\,y_4, 0, 2\,y_4, 2\,y_3]$$

$p = s^3 - s^5$ $p' = -s^3 + s^5$ $p' = -s^4 + s^6$

Omega Rank for B : cycles: {{5, 7}} order: 4

See Matrix

$$[y_3, y_2, 0, -y_3 + y_2 - y_1 + y_4, y_1, 0, y_4, 0, 0]$$

$p = -s^4 + s^5$

238 . Coloring, {2, 4, 5, 7, 8, 9}

R: [4, 9, 4, 8, 3, 7, 5, 6, 2]
B: [2, 4, 5, 7, 7, 8, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	7 *vs* 8	6 *vs* 8	4 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {3, 4, 5, 6, 7, 8}} order: 6

See Matrix

$$[0, y_1, 4\,y_1 - y_4 - y_3 + y_2, y_1 - y_6 - y_5 + 4\,y_2, y_6, y_5, y_4, y_3, y_2]$$

$p' = -s + s^7$ $p = -s + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1 - y_2 + y_3, y_1, 0, y_2, y_4, 0, y_3, y_4, 0]$$

$p = s^2 - s^6$ $p' = s^2 - s^3 + s^4 - s^5$

239 . Coloring, {2, 4, 6, 7, 8, 9}

R: [4, 9, 4, 8, 7, 8, 5, 6, 2]
B: [2, 4, 5, 7, 3, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	3 *vs* 7	4 *vs* 6

Omega Rank for R : cycles: {{2, 9}, {5, 7}, {6, 8}} order: 2

See Matrix

$$[0, y_3, 0, y_2, -5\,y_3 + 4\,y_1, -10\,y_3 - y_2 + 8\,y_1, y_1, 2\,y_1, -4\,y_3 + 3\,y_1]$$

$p' = s^2 - s^6$ $p = -s^2 + s^4$ $p = -s^2 + s^6$ $p' = s^4 - s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}, {3, 5}} order: 4

See Matrix

$$[3\,y_3 - y_4 + 2\,y_2,\ 2\,y_3 + 3\,y_2 - y_1,\ y_3,\ y_4,\ y_2,\ 0,\ y_1,\ 0,\ 0]$$

$p = s - s^5$ $p' = s - s^5$

240 . Coloring, {2, 5, 6, 7, 8, 9}

R: [4, 9, 4, 7, 3, 8, 5, 6, 2]
B: [2, 4, 5, 8, 7, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	7 *vs* 8	4 *vs* 8	5 *vs* 6

Omega Rank for R : cycles: {{3, 4, 5, 7}, {2, 9}, {6, 8}} order: 4

See Matrix

$$[0,\ y_3,\ 3\,y_3 - y_2 + y_4,\ y_3 - y_1 + 3\,y_4,\ y_1,\ y_4,\ y_2,\ y_3,\ y_4]$$

$p' = s - s^5$ $p' = s^2 - s^6$ $p = s - s^5$ $p' = -s^3 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1 - y_2 - y_3 + y_4 + y_5,\ y_1,\ 0,\ y_2,\ y_3,\ 0,\ y_4,\ y_5,\ 0]$$

$p = -s^3 + s^4 - s^5 + s^6$

241 . Coloring, {3, 4, 5, 6, 7, 8}

Ωp(Δ)=0: $p = s^2 - 2s^4 - 8s^5 + 16s^7$

R: [4, 4, 5, 8, 3, 8, 5, 6, 1]
B: [2, 9, 4, 7, 7, 7, 1, 1, 2]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	7 *vs* 7	7 *vs* 7	4 *vs* 6	5 *vs* 5

Omega Rank for R : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[3\,y_1 - 4\,y_3 + 3\,y_2 - y_4,\ 0,\ 2\,y_1 - 3\,y_3 + 2\,y_2,\ y_1,\ y_3,\ y_2,\ 0,\ y_4,\ 0]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$

Omega Rank for B : cycles: {{2, 9}} order: 4

See Matrix

$$[y_5,\ y_4,\ 0,\ y_3,\ 0,\ 0,\ y_2,\ 0,\ y_1]$$

242 . Coloring, {3, 4, 5, 6, 7, 9}

R: [4, 4, 5, 8, 3, 8, 5, 1, 2]
B: [2, 9, 4, 7, 7, 7, 1, 6, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	5 *vs* 6	5 *vs* 6

Omega Rank for R : cycles: {{3, 5}, {1, 4, 8}} order: 6

See Matrix

$$[-y_2 + 2\,y_1 - y_4 + 2\,y_5 - y_3,\ y_2,\ y_1,\ y_4,\ y_5,\ 0,\ 0,\ y_3,\ 0]$$

$p = -s^2 - s^3 + s^5 + s^6$

Omega Rank for B : cycles: {{1, 2, 9}} order: 3

See Matrix

$$[y_2,\ y_1,\ 0,\ y_3,\ 0,\ 2\,y_3,\ y_4,\ 0,\ y_5]$$

$p = s^3 - s^6$

243 . Coloring, {3, 4, 5, 6, 8, 9}

R: [4, 4, 5, 8, 3, 8, 1, 6, 2]
B: [2, 9, 4, 7, 7, 7, 5, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	7 *vs* 8	4 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[3\,y_4, y_4, y_3, y_2, y_1, 2\,y_3 - y_2 + 3\,y_1, 0, -4\,y_4 + 3\,y_3 + 2\,y_1, 0]$$

$p = s^3 - s^7$ $p' = s^4 - s^6$ $p' = -s^3 + s^5$

Omega Rank for B : cycles: {{1, 2, 9}, {5, 7}} order: 6

See Matrix

$$[4\,y_1, 4\,y_2, 0, 4\,y_5, 5\,y_1 + 5\,y_2 - 4\,y_5 - 4\,y_4 + 5\,y_3, 0, 4\,y_4, 0, 4\,y_3]$$

$p = -s^2 - s^3 + s^5 + s^6$

244 . Coloring, {3, 4, 5, 7, 8, 9}

R: [4, 4, 5, 8, 3, 7, 5, 6, 2]
B: [2, 9, 4, 7, 7, 8, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	7 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{3, 5}} order: 6

See Matrix

$$[0, y_3, y_2, y_1, y_4, y_7, y_6, y_5, 0]$$

Omega Rank for B : cycles: {{1, 2, 9}} order: 3

See Matrix

$$[y_1, y_2, 0, y_3, 0, 0, y_5, y_3, y_4]$$

$p = -s^3 + s^6$

245 . Coloring, {3, 4, 6, 7, 8, 9}

R: [4, 4, 5, 8, 7, 8, 5, 6, 2]
B: [2, 9, 4, 7, 3, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	6 *vs* 6

Omega Rank for R : cycles: {{5, 7}, {6, 8}} order: 4

See Matrix

$$[0, 3y_1 - 4y_2 + 3y_3 - y_4, 0, y_1, y_2, y_3, 2y_1 - 3y_2 + 2y_3, y_4, 0]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$

Omega Rank for B : cycles: {{1, 2, 9}} order: 6

See Matrix

$$[y_4, y_5, y_1, y_2, 0, 0, y_3, 0, y_6]$$

246 . Coloring, {3, 5, 6, 7, 8, 9}

R: [4, 4, 5, 7, 3, 8, 5, 6, 2]
B: [2, 9, 4, 8, 7, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	5 *vs* 7	5 *vs* 6

Omega Rank for R : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[0, y_5, y_4, y_3, y_2, y_1, -y_5 - y_4 - 15y_1 + 4y_3 + 4y_2, y_3 + y_2 - 4y_1, 0]$$

$p = -s^4 + s^6$ $p' = s^4 - s^6$

Omega Rank for B : cycles: {{1, 2, 9}} order: 3

See Matrix

$$[y_3, y_4, 0, y_5, 0, 0, 3\,y_5, y_1, y_2]$$

$p = -s^3 + s^6$

247 . Coloring, {4, 5, 6, 7, 8, 9}

R: [4, 4, 4, 8, 3, 8, 5, 6, 2]
B: [2, 9, 5, 7, 7, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 6	5 *vs* 5

Omega Rank for R : cycles: {{6, 8}} order: 4

See Matrix

$$[0, y_2, y_1, y_4, 3\,y_2, y_3, 0, y_5, 0]$$

$p = s^4 - s^6$

Omega Rank for B : cycles: {{1, 2, 9}} order: 3

See Matrix

$$[y_1, y_3, 0, 0, y_2, 0, y_4, 0, y_5]$$

248 . Coloring, {2, 3, 4, 5, 6, 7, 8}

Ωp(Δ)=0: $p = -s^3 + s^4 + 8s^7$

R: [4, 9, 5, 8, 3, 8, 5, 6, 1]
B: [2, 4, 4, 7, 7, 7, 1, 1, 2]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
6 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 7	4 *vs* 4

Omega Rank for R : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[y_2, 0, y_1, y_5, 2\,y_2 - 3\,y_1 + 2\,y_3, y_4, 0, y_3, 3\,y_2 - 4\,y_1 - y_5 - y_4 + 3\,y_3]$$

$p' = -s^4 + s^6$ $p = -s^4 + s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_2, y_3, 0, y_1, 0, 0, y_4, 0, 0]$$

249 . Coloring, {2, 3, 4, 5, 6, 7, 9}

R: [4, 9, 5, 8, 3, 8, 5, 1, 2]
B: [2, 4, 4, 7, 7, 7, 1, 6, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 7	4 *vs* 5

Omega Rank for R : cycles: {{2, 9}, {3, 5}, {1, 4, 8}} order: 6

See Matrix

$$[y_2, y_1, 2\,y_1, -y_2 + 3\,y_1 - y_4 + 3\,y_3, 2\,y_3, 0, 0, y_4, y_3]$$

$p' = s^2 + s^3 - s^5 - s^6$ $p' = s - s^3 - s^4 + s^6$ $p = s - s^7$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1 - y_2 - y_3 + y_4, y_1, 0, y_2, 0, y_3, y_4, 0, 0]$$

$p = s^2 - s^3 + s^4 - s^5$

250 . Coloring, {2, 3, 4, 5, 6, 8, 9}

R: [4, 9, 5, 8, 3, 8, 1, 6, 2]
B: [2, 4, 4, 7, 7, 7, 5, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 8	4 *vs* 5

Omega Rank for R : cycles: {{2, 9}, {3, 5}, {6, 8}} order: 4

See Matrix

$$[y_2 + 3\,y_4 - y_3, y_2, y_4, 3\,y_2 + y_4 - y_1, y_2, y_1, 0, y_3, y_4]$$

$p = -s^3 + s^5$ $p = -s^3 + s^7$ $p' = -s^3 + s^7$ $p' = -s^3 + s^5$

Omega Rank for B : cycles: {{5, 7}} order: 4

See Matrix

$$[y_2, y_2 + y_1 + y_3 - y_4, 0, y_1, y_3, 0, y_4, 0, 0]$$

$p = -s^4 + s^5$

251 . Coloring, {2, 3, 4, 5, 7, 8, 9}

R: [4, 9, 5, 8, 3, 7, 5, 6, 2]
B: [2, 4, 4, 7, 7, 8, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	6 *vs* 8	4 *vs* 5

Omega Rank for R : cycles: {{2, 9}, {3, 5}} order: 6

See Matrix

$$[0, y_6, y_3, y_4, y_5, -15\,y_6 - y_4 - y_5 + 4\,y_3 + 4\,y_2 + 4\,y_1, y_2, y_1, -4\,y_6 + y_3 + y_2 + y_1]$$

$p' = -s^5 + s^7$ $p = -s^5 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1, y_1 + y_2 - y_3 - y_4, 0, y_2, 0, 0, y_3, y_4, 0]$$

$p = s^2 - s^3 + s^4 - s^5$

252 . Coloring, {2, 3, 4, 6, 7, 8, 9}

R: [4, 9, 5, 8, 7, 8, 5, 6, 2]
B: [2, 4, 4, 7, 3, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	8 *vs* 8	8 *vs* 8	3 *vs* 7	4 *vs* 5

Omega Rank for R : cycles: {{2, 9}, {6, 8}, {5, 7}} order: 2

See Matrix

$$[0, y_1 + y_2 - 2\,y_3, 0, y_1, 2\,y_3, y_2, 2\,y_1 + 2\,y_2 - 4\,y_3, 2\,y_1 + 2\,y_2 - 3\,y_3, y_3]$$

$p' = s^2 - s^6$ $p' = s^3 - s^5$ $p' = s^4 - s^6$ $p = s^2 - s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1 + y_2 - y_4 + y_3, y_1, y_2, y_4, 0, 0, y_3, 0, 0]$$

$p = s^2 - s^3 + s^4 - s^5$

253 . Coloring, {2, 3, 5, 6, 7, 8, 9}

R: [4, 9, 5, 7, 3, 8, 5, 6, 2]
B: [2, 4, 4, 8, 7, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	9 *vs* 9	9 *vs* 9	4 *vs* 8	4 *vs* 5

Omega Rank for R : cycles: {{2, 9}, {3, 5}, {6, 8}} order: 4

See Matrix

$$[0, y_1, 3\,y_1 + y_2 - y_4, y_1 - y_3 + 3\,y_2, y_3, y_2, y_4, y_1, y_2]$$

$p = -s^3 + s^5$ $p' = -s^3 + s^5$ $p = -s^3 + s^7$ $p' = -s^3 + s^7$

Omega Rank for B : cycles: {{1, 2, 4, 8}} order: 4

See Matrix

$$[y_1, y_1 + y_4 - y_3 - y_2, 0, y_4, 0, 0, y_3, y_2, 0]$$

$p = s^2 - s^3 + s^4 - s^5$

254 . Coloring, {2, 4, 5, 6, 7, 8, 9}

R: [4, 9, 4, 8, 3, 8, 5, 6, 2]
B: [2, 4, 5, 7, 7, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	**A+(1/2)Δ**	**A-(1/2)Δ**	**R**	**B**
7 *vs* 7	7 *vs* 7	7 *vs* 7	5 *vs* 7	4 *vs* 5

Omega Rank for R : cycles: {{2, 9}, {6, 8}} order: 4

See Matrix

$$[0, y_1, y_4, y_5, y_3, -15\,y_1 - y_5 - y_3 + 4\,y_4 + 4\,y_2, 0, y_2, -4\,y_1 + y_4 + y_2]$$

$p' = -s^4 + s^6$ $p = s^4 - s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_4, y_3, 0, y_2, y_1, 0, y_4 - y_3 + y_2 + y_1, 0, 0]$$

$p = -s^2 + s^3 - s^4 + s^5$

255 . Coloring, {3, 4, 5, 6, 7, 8, 9}

R: [4, 4, 5, 8, 3, 8, 5, 6, 2]
B: [2, 9, 4, 7, 7, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	4 *vs* 6	5 *vs* 5

Omega Rank for R : cycles: {{3, 5}, {6, 8}} order: 4

See Matrix

$$[0, 3\,y_2 - 4\,y_3 + 3\,y_1 - y_4, 2\,y_2 - 3\,y_3 + 2\,y_1, y_2, y_3, y_1, 0, y_4, 0]$$

$p = s^3 - s^5$ $p' = s^3 - s^5$

Omega Rank for B : cycles: {{1, 2, 9}} order: 3

See Matrix

$$[y_1, y_2, 0, y_3, 0, 0, y_4, 0, y_5]$$

256 . Coloring, {2, 3, 4, 5, 6, 7, 8, 9}

R: [4, 9, 5, 8, 3, 8, 5, 6, 2]
B: [2, 4, 4, 7, 7, 7, 1, 1, 1]

` See graph

` ` See pair graph

`

Δ-Rank	A+(1/2)Δ	A-(1/2)Δ	R	B
7 *vs* 7	8 *vs* 8	8 *vs* 8	3 *vs* 7	3 *vs* 4

Omega Rank for R : cycles: {{2, 9}, {3, 5}, {6, 8}} order: 2

See Matrix

$$[0, y_1 + y_2 - 2\,y_3, 2\,y_1 + 2\,y_2 - 4\,y_3, y_1, 2\,y_3, y_2, 0, 2\,y_1 + 2\,y_2 - 3\,y_3, y_3]$$

$p = -s^2 + s^4$ $p' = s^4 - s^6$ $p = -s^2 + s^6$ $p' = s^2 - s^6$

Omega Rank for B : cycles: {{1, 2, 4, 7}} order: 4

See Matrix

$$[y_1, y_2, 0, -y_1 + y_2 + y_3, 0, 0, y_3, 0, 0]$$

$p = -s + s^2 - s^3 + s^4$

SUMMARY	
Graph Type	CC
ν(A)	2
ν(Δ)	2
π	[3, 2, 1, 3, 2, 1, 3, 2, 1]
Dbly Stoch	false

SANDWICH		Total 4
No .	**Coloring**	**Rank**
1	{}	3
2	{2, 3, 5, 6, 8, 9}	6
3	{2, 5, 8}	3
4	{3, 6, 9}	3

RT GROUPS		Total 1	
No .	**Coloring**	**Rank**	**Solv**
1	{2, 4, 7, 9}	2	Not Solvable

CC Colorings		Total 1
No .	**Coloring**	**Sandwich,Rank**
1	{}	true, 3

Δ-RANK'D	**SC'D !RK'D**	**τ-RANK'D**	**R/B RANK'D**	**NOT SYNC'D**	**Total Runs**	2^{n-1}
213	0	243 , 247	28 , 44	5	256	256