

New Graph

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

$$\pi = [1, 2, 3, 4, 6, 8]$$

$$\delta = [1, 1, 1, 1, 3, 5]$$

POSSIBLE RANKS

- 1 x 24
- 2 x 12
- 3 x 8
- 4 x 6

BASE DETERMINANT 153/1024, .1494140625

NullSpace of Δ

{1, 2, 3, 4, 5, 6}

Nullspace of A

[{4, 6}, {1, 2, 3, 5}]

1. Coloring, {}

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

` See graph

` ` See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	5 vs 5	2 vs 2	5 vs 5

Ω_+ Rank for R :

$$-t \quad t^3$$

, cycles: {{5, 6}} order: 2

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 8 & 16 \\ 0 & 0 & 0 & 0 & 16 & 8 \end{pmatrix}$$

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

Ω_+ Rank for B :

$$-t^4 \quad t^6$$

, cycles: {{3, 5}} order: 4

$$\begin{matrix} 2 & 4 & 6 & 8 & 4 & 0 \\ 4 & 8 & 4 & 0 & 8 & 0 \\ (8 & 0 & 8 & 0 & 8 & 0) \\ 0 & 0 & 8 & 0 & 16 & 0 \\ 0 & 0 & 16 & 0 & 8 & 0 \end{matrix}$$

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

2 . Coloring, {2}

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

\ See graph

\ \ See pair graph

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

Omega Rank for R :

$$-t^2 + t^4$$

, cycles: {{5, 6}} order: 2

$$\begin{matrix} 2 & 0 & 0 & 0 & 8 & 14 \\ (0 & 0 & 0 & 0 & 14 & 10) \\ 0 & 0 & 0 & 0 & 10 & 14 \end{matrix}$$

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

Omega Rank for B :

$$-t - t^2 + t^4 + t^5$$

, cycles: {{3, 5}, {2, 4, 6}} order: 6

$$\begin{matrix} 0 & 4 & 6 & 8 & 4 & 2 \\ 0 & 8 & 4 & 2 & 6 & 4 \\ (0 & 2 & 6 & 4 & 4 & 8) \\ 0 & 4 & 4 & 8 & 6 & 2 \\ 0 & 8 & 6 & 2 & 4 & 4 \end{matrix}$$

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

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

3 . Coloring, {3}

R: [6, 6, 5, 6, 6, 5]

B: [5, 1, 6, 2, 3, 4]

\ See graph

\ \ See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	2 vs 2	6 vs 6

Omega Rank for R :

$$-t^+ t^3$$

, cycles: {{5, 6}} order: 2

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 11 & 13 \\ 0 & 0 & 0 & 0 & 13 & 11 \end{pmatrix}$$

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

Omega Rank for B :

$$-1^+ t^6$$

, cycles: {{1, 2, 3, 4, 5, 6}} order: 6

$$\begin{pmatrix} 2 & 4 & 6 & 8 & 1 & 3 \\ 4 & 8 & 1 & 3 & 2 & 6 \\ 8 & 3 & 2 & 6 & 4 & 1 \\ 3 & 6 & 4 & 1 & 8 & 2 \\ 6 & 1 & 8 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 & 6 & 8 \end{pmatrix}$$

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

4 . Coloring, {4}

$$\Omega p(\Delta)=0: p = s^3 - 4s^5 \quad p' = s^3 - 2s^4$$

R: [6, 6, 6, 2, 6, 5]

B: [5, 1, 5, 6, 3, 4]

\ See graph

\ \ See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
3 vs 5	3 vs 5	3 vs 5	2 vs 3	3 vs 5

Omega Rank for R :

$$-t^{2+} t^4$$

, cycles: {{5, 6}} order: 2

0 4 0 0 8 12
 (0 0 0 0 12 12)
 0 0 0 0 12 12

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

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

Omega Rank for B :
 $-t^{2+} t^4$

cycles: {{4, 6}, {3, 5}} order: 2

2 0 6 8 4 4
 0 0 4 4 8 8
 (0 0 8 8 4 4)
 0 0 4 4 8 8
 0 0 8 8 4 4

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

$p = -s^{2+} s^4 \quad p' = -s^{2+} s^4$

	M	N
0 0 0 1 0 0	0 0 0 1 0 1	
0 0 0 0 0 2	0 0 0 1 0 1	
(0 0 0 3 0 0)	(0 0 0 1 0 1)	
(1 0 3 0 0 0)	(1 1 1 0 1 0)	
0 0 0 0 0 6	0 0 0 1 0 1	
0 2 0 0 6 0	1 1 1 0 1 0	
	NM	
	1 2 3 0 6 0	
	1 2 3 0 6 0	
	(1 2 3 0 6 0)	
	(0 0 0 4 0 8)	
	1 2 3 0 6 0	
	0 0 0 4 0 8	

$\tau = 20, r' = 1/2$

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

Ranges

Action of R on ranges, $[[2], [4], [2], [4]]$
 Action of B on ranges, $[[4], [1], [4], [3]]$

Cycles: R, {{5, 6}}, B, {{4, 6}, {3, 5}}

- $\beta(\{1, 4\}) = 1/12$
- $\beta(\{2, 6\}) = 1/6$
- $\beta(\{3, 4\}) = 1/4$
- $\beta(\{5, 6\}) = 1/2$

Partitions

$$\alpha(\{\{1, 2, 3, 5\}, \{4, 6\}\}) = 1/1$$

$$b_1 = \{1, 2, 3, 5\}, b_2 = \{4, 6\}$$

Action of R and B on the blocks of the partitions: = $[2, 1][1, 2]$
with invariant measure $[1, 1]$

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

See level-2 partition graph.

Right Group	
Coloring	{4}
Rank	2
R,B	[6, 6, 6, 2, 6, 5], [5, 1, 5, 6, 3, 4]
π_2	[0, 0, 1, 0, 0, 0, 0, 2, 3, 0, 0, 0, 0, 6]
u_2	[0, 0, 1, 0, 1, 0, 1, 0, 1, 1, 0, 1, 1, 0, 1] (dim 1)
wpp	[4, 4, 4, 2, 4, 2]

5. Coloring, {5}

$$R: [6, 6, 6, 6, 3, 5]$$

$$B: [5, 1, 5, 2, 6, 4]$$

See graph

See pair graph

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	5 vs 5	3 vs 3	5 vs 5

Ω_+ Rank for R :

$$-t \quad t^4$$

cycles: {{3, 5, 6}} order: 3

$$\begin{matrix} 0 & 0 & 6 & 0 & 8 & 10 \\ (0 & 0 & 8 & 0 & 10 & 6) \\ 0 & 0 & 10 & 0 & 6 & 8 \end{matrix}$$

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

Ω_+ Rank for B :

$$-t \quad t^6$$

cycles: {{1, 2, 4, 5, 6}} order: 5

2 4 0 8 4 6
 4 8 0 6 2 4
 (8 6 0 4 4 2)
 6 4 0 2 8 4
 4 2 0 4 6 8

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

6 . Coloring, {6}

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

- ` See graph
- `` See pair graph
- ,

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	5 vs 5	2 vs 2	4 vs 4

Omega Rank for R :

$$-t^+ \quad t^3$$

, cycles: {{4, 6}} order: 2

$$\begin{pmatrix} 0 & 0 & 0 & 8 & 0 & 16 \\ 0 & 0 & 0 & 16 & 0 & 8 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^3 \quad t^5$$

, cycles: {{3, 5}} order: 4

$$\begin{pmatrix} 2 & 4 & 6 & 0 & 12 & 0 \\ 4 & 0 & 12 & 0 & 8 & 0 \\ 0 & 0 & 8 & 0 & 16 & 0 \\ 0 & 0 & 16 & 0 & 8 & 0 \end{pmatrix}$$

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

7 . Coloring, {2, 3}

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

- ` See graph
- `` See pair graph

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	3 vs 3	5 vs 5

Omega Rank for R :

$$-t^{2+} t^4$$

cycles: {{5, 6}} order: 2

$$\begin{pmatrix} 2 & 0 & 0 & 0 & 11 & 11 \\ 0 & 0 & 0 & 0 & 11 & 13 \\ 0 & 0 & 0 & 0 & 13 & 11 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^{3+} t^6$$

cycles: {{2, 4, 6}} order: 3

$$\begin{pmatrix} 0 & 4 & 6 & 8 & 1 & 5 \\ 0 & 8 & 1 & 5 & 0 & 10 \\ 0 & 5 & 0 & 10 & 0 & 9 \\ 0 & 10 & 0 & 9 & 0 & 5 \\ 0 & 9 & 0 & 5 & 0 & 10 \end{pmatrix}$$

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

8 . Coloring, {2, 4}

$$R: [6, 1, 6, 2, 6, 5]$$

$$B: [5, 6, 5, 6, 3, 4]$$

[` See graph](#)

[`` See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	5 vs 5	4 vs 4	2 vs 4

Omega Rank for R :

$$-t^{3+} t^5$$

cycles: {{5, 6}} order: 4

$$\begin{pmatrix} 2 & 4 & 0 & 0 & 8 & 10 \\ 4 & 0 & 0 & 0 & 10 & 10 \\ 0 & 0 & 0 & 0 & 10 & 14 \\ 0 & 0 & 0 & 0 & 14 & 10 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^+ t^3$$

' cycles: {{4, 6}, {3, 5}} order: 2

$$\begin{pmatrix} 0 & 0 & 6 & 8 & 4 & 6 \\ 0 & 0 & 4 & 6 & 6 & 8 \\ 0 & 0 & 6 & 8 & 4 & 6 \\ 0 & 0 & 4 & 6 & 6 & 8 \end{pmatrix}$$

$$[0, 0, -6y_2 + 5y_1, -7y_2 + 6y_1, y_2, y_1]$$

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

9 . Coloring, {2, 5}

$$\Omega p(\Delta)=0: \quad p' = s^4 \quad p = s^4$$

$$R: [6, 1, 6, 6, 3, 5]$$

$$B: [5, 6, 5, 2, 6, 4]$$

` See graph

` ` See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
3 vs 5	3 vs 5	3 vs 5	2 vs 4	2 vs 4

Omega Rank for R :

$$-t^{2+} t^5$$

' cycles: {{3, 5, 6}} order: 3

$$\begin{pmatrix} 2 & 0 & 6 & 0 & 8 & 8 \\ 0 & 0 & 8 & 0 & 8 & 8 \\ 0 & 0 & 8 & 0 & 8 & 8 \\ 0 & 0 & 8 & 0 & 8 & 8 \end{pmatrix}$$

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

$$p = -s^{2+} s^4 \quad p = -s^{2+} s^3$$

Omega Rank for B :

$$-t^{2+} t^5$$

' cycles: {{2, 4, 6}} order: 3

$$\begin{pmatrix} 0 & 4 & 0 & 8 & 4 & 8 \\ 0 & 8 & 0 & 8 & 0 & 8 \\ 0 & 8 & 0 & 8 & 0 & 8 \\ 0 & 8 & 0 & 8 & 0 & 8 \end{pmatrix}$$

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

$$p = -s^{2+} s^3 \quad p = -s^{2+} s^4$$

See 3-level graph

	M	N	
0	0	0	1
0	0	0	2
0	0	0	3
0	2	0	2
1	0	3	2
1	2	3	4
	6	0	
	1	1	1
	1	1	1
	1	1	1
	1	1	0
	2	2	6
	8	6	8
	1	4	3
	4	12	8
	2	2	6
	8	6	8
	2	2	6
	8	6	8
	1	4	3
	4	12	8
	1	2	3
	4	6	16

$\tau = 14, r' = 2/3$

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

Ranges

Action of R on ranges, [[3], [1], [3], [3]]
 Action of B on ranges, [[4], [2], [4], [2]]

Cycles: R, {{3, 5, 6}}, B, {{2, 4, 6}}

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

Partitions

$\alpha(\{\{2, 5\}, \{6\}, \{1, 3, 4\}\}) = 1/1$

$b_1 = \{2, 5\}, b_2 = \{6\}, b_3 = \{1, 3, 4\}$

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

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

See level-3 partition graph.

Right Group	
Coloring	{2, 5}
Rank	3
R,B	[6, 1, 6, 6, 3, 5], [5, 6, 5, 2, 6, 4]

π_2	[0, 0, 0, 1, 1, 0, 2, 0, 2, 0, 3, 3, 2, 4, 6]
u_2	[1, 0, 0, 1, 1, 1, 1, 0, 1, 0, 1, 1, 1, 1, 1] (dim 1)
wpp	[3, 2, 3, 3, 2, 1]
π_3	[0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 2, 0, 0, 0, 3, 2]
u_3	[0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 1, 1]

10 . Coloring, {2, 6}

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

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

` See graph

` ` See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 5	5 vs 5	5 vs 5	3 vs 3	4 vs 4

Omega Rank for R :

$-t^2 + t^4$

' cycles: {{4, 6}} order: 2

$$\begin{pmatrix} 2 & 0 & 0 & 8 & 0 & 14 \\ 0 & 0 & 0 & 14 & 0 & 10 \\ 0 & 0 & 0 & 10 & 0 & 14 \end{pmatrix}$$

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

Omega Rank for B :

$-t^3 + t^5$

' cycles: {{3, 5}} order: 4

$$\begin{pmatrix} 0 & 4 & 6 & 0 & 12 & 2 \\ 0 & 0 & 12 & 0 & 8 & 4 \\ 0 & 0 & 8 & 0 & 16 & 0 \\ 0 & 0 & 16 & 0 & 8 & 0 \end{pmatrix}$$

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

11 . Coloring, {3, 4}

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

[` See graph](#)

[`` See pair graph](#)

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	3 vs 3	5 vs 5

Omega Rank for R :

$$-t^2 + t^4$$

, cycles: {{5, 6}} order: 2

$$\begin{pmatrix} 0 & 4 & 0 & 0 & 11 & 9 \\ 0 & 0 & 0 & 0 & 9 & 15 \\ 0 & 0 & 0 & 0 & 15 & 9 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^4 + t^6$$

, cycles: {{4, 6}} order: 4

$$\begin{pmatrix} 2 & 0 & 6 & 8 & 1 & 7 \\ 0 & 0 & 1 & 7 & 2 & 14 \\ 0 & 0 & 2 & 14 & 0 & 8 \\ 0 & 0 & 0 & 8 & 0 & 16 \\ 0 & 0 & 0 & 16 & 0 & 8 \end{pmatrix}$$

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

12 . Coloring, {3, 5}

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

[` See graph](#)

[`` See pair graph](#)

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	3 vs 3	5 vs 5

Omega Rank for R :

$$-t^2 + t^4$$

, cycles: {{3, 5}} order: 2

0 0 6 0 11 7
 (0 0 11 0 13 0)
 0 0 13 0 11 0

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

Omega Rank for B :

$$-t^+ t^6$$

, cycles: {{1, 2, 4, 5, 6}} order: 5

2 4 0 8 1 9
 4 8 0 9 2 1
 (8 9 0 1 4 2)
 9 1 0 2 8 4
 1 2 0 4 9 8

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

13 . Coloring, {3, 6}

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

` See graph

` ` See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	3 vs 3	5 vs 5

Omega Rank for R :

$$-t^{2+} t^4$$

, cycles: {{4, 6}} order: 2

0 0 0 8 3 13
 (0 0 0 13 0 11)
 0 0 0 11 0 13

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

Omega Rank for B :

$$-t^3+ t^6$$

, cycles: {{3, 5, 6}} order: 3

2 4 6 0 9 3
 4 0 9 0 5 6
 (0 0 5 0 10 9)
 0 0 10 0 9 5
 0 0 9 0 5 10

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

14 . Coloring, {4, 5}

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

` See graph

` ` See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	5 vs 5	4 vs 4	3 vs 4

Omega Rank for R :

$-t^2 + t^5$

' cycles: {{3, 5, 6}} order: 3

0 4 6 0 8 6
 0 0 8 0 6 10
 (0 0 6 0 10 8)
 0 0 10 0 8 6

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

Omega Rank for B :

$-t^3 + t^5$

' cycles: {{4, 6}} order: 4

2 0 0 8 4 10
 0 0 0 10 2 12
 (0 0 0 12 0 12)
 0 0 0 12 0 12

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

$p = s^3 - s^4$

15 . Coloring, {4, 6}

R: [6, 6, 6, 2, 6, 4]

B: [5, 1, 5, 6, 3, 5]

` See graph

` ` See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	4 vs 5	3 vs 3	2 vs 4

Omega Rank for R :

$$-t^+ t^4$$

, cycles: {{2, 4, 6}} order: 3

$$\begin{pmatrix} 0 & 4 & 0 & 8 & 0 & 12 \\ 0 & 8 & 0 & 12 & 0 & 4 \\ 0 & 12 & 0 & 4 & 0 & 8 \end{pmatrix}$$

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

Omega Rank for B :

$$\text{tailcheck } -t^2+ t^4$$

, cycles: {{3, 5}} order: 2

$$\begin{pmatrix} 2 & 0 & 6 & 0 & 12 & 4 \\ 0 & 0 & 12 & 0 & 12 & 0 \\ 0 & 0 & 12 & 0 & 12 & 0 \\ 0 & 0 & 12 & 0 & 12 & 0 \end{pmatrix}$$

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

$$p = -s^{2+} s^3 \quad p = -s^{2+} s^4$$

16 . Coloring, {5, 6}

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

B: [5, 1, 5, 2, 6, 5]

` See graph

` ` See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	5 vs 5	3 vs 3	4 vs 4

Omega Rank for R :

$$-t^{2+} t^4$$

, cycles: {{4, 6}} order: 2

$$\begin{pmatrix} 0 & 0 & 6 & 8 & 0 & 10 \\ 0 & 0 & 0 & 10 & 0 & 14 \\ 0 & 0 & 0 & 14 & 0 & 10 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^3 + t^5$$

, cycles: {{5, 6}} order: 4

$$\begin{pmatrix} 2 & 4 & 0 & 0 & 12 & 6 \\ 4 & 0 & 0 & 0 & 8 & 12 \\ 0 & 0 & 0 & 0 & 16 & 8 \\ 0 & 0 & 0 & 0 & 8 & 16 \end{pmatrix}$$

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

17 . Coloring, {2, 3, 4}

R: [6, 1, 5, 2, 6, 5]

B: [5, 6, 6, 6, 3, 4]

` See graph

` ` See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	4 vs 4	4 vs 4

Omega Rank for R :

$$-t^3 + t^5$$

, cycles: {{5, 6}} order: 4

$$\begin{pmatrix} 2 & 4 & 0 & 0 & 11 & 7 \\ 4 & 0 & 0 & 0 & 7 & 13 \\ 0 & 0 & 0 & 0 & 13 & 11 \\ 0 & 0 & 0 & 0 & 11 & 13 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^3 + t^5$$

, cycles: {{4, 6}} order: 4

$$\begin{pmatrix} 0 & 0 & 6 & 8 & 1 & 9 \\ 0 & 0 & 1 & 9 & 0 & 14 \\ 0 & 0 & 0 & 14 & 0 & 10 \\ 0 & 0 & 0 & 10 & 0 & 14 \end{pmatrix}$$

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

18 . Coloring, {2, 3, 5}

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

- ` See graph
- `` See pair graph
- `

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	4 vs 4	4 vs 4

Omega Rank for R :

$$-t^3 + t^5$$

cycles: {{3, 5}} order: 4

$$\begin{pmatrix} 2 & 0 & 6 & 0 & 11 & 5 \\ 0 & 0 & 11 & 0 & 11 & 2 \\ 0 & 0 & 11 & 0 & 13 & 0 \\ 0 & 0 & 13 & 0 & 11 & 0 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^2 + t^5$$

cycles: {{2, 4, 6}} order: 3

$$\begin{pmatrix} 0 & 4 & 0 & 8 & 1 & 11 \\ 0 & 8 & 0 & 11 & 0 & 5 \\ 0 & 11 & 0 & 5 & 0 & 8 \\ 0 & 5 & 0 & 8 & 0 & 11 \end{pmatrix}$$

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

19 . Coloring, {2, 3, 6}

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

- ` See graph
- `` See pair graph
- `

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	3 vs 4	4 vs 4

Omega Rank for R :

$$\text{tailcheck } -t^2 + t^4$$

cycles: {{4, 6}} order: 2

$$\begin{pmatrix} 2 & 0 & 0 & 8 & 3 & 11 \\ 0 & 0 & 0 & 11 & 0 & 13 \\ 0 & 0 & 0 & 13 & 0 & 11 \\ 0 & 0 & 0 & 11 & 0 & 13 \end{pmatrix}$$

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

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

Omega Rank for B :

$$-t^2 + t^5$$

, cycles: {{3, 5, 6}} order: 3

$$\begin{pmatrix} 0 & 4 & 6 & 0 & 9 & 5 \\ 0 & 0 & 9 & 0 & 5 & 10 \\ 0 & 0 & 5 & 0 & 10 & 9 \\ 0 & 0 & 10 & 0 & 9 & 5 \end{pmatrix}$$

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

20 . Coloring, {2, 4, 5}

$$R: [6, 1, 6, 2, 3, 5]$$

$$B: [5, 6, 5, 6, 6, 4]$$

` See graph

` ` See pair graph

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Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	4 vs 5	5 vs 5	2 vs 3

Omega Rank for R :

$$-t^3 + t^6$$

, cycles: {{3, 5, 6}} order: 3

$$\begin{pmatrix} 2 & 4 & 6 & 0 & 8 & 4 \\ 4 & 0 & 8 & 0 & 4 & 8 \\ 0 & 0 & 4 & 0 & 8 & 12 \\ 0 & 0 & 8 & 0 & 12 & 4 \\ 0 & 0 & 12 & 0 & 4 & 8 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^2 + t^4$$

, cycles: {{4, 6}} order: 2

$$\begin{pmatrix} 0 & 0 & 0 & 8 & 4 & 12 \\ 0 & 0 & 0 & 12 & 0 & 12 \\ 0 & 0 & 0 & 12 & 0 & 12 \end{pmatrix}$$

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

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

21 . Coloring, {2, 4, 6}

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

\ See graph

\ \ See pair graph

\

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	5 vs 5	4 vs 4	2 vs 3

Omega Rank for R :

$$-t + t^5$$

, cycles: {{1, 2, 4, 6}} order: 4

$$\begin{pmatrix} 2 & 4 & 0 & 8 & 0 & 10 \\ 4 & 8 & 0 & 10 & 0 & 2 \\ 8 & 10 & 0 & 2 & 0 & 4 \\ 10 & 2 & 0 & 4 & 0 & 8 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^2 + t^4$$

, cycles: {{3, 5}} order: 2

$$\begin{pmatrix} 0 & 0 & 6 & 0 & 12 & 6 \\ 0 & 0 & 12 & 0 & 12 & 0 \\ 0 & 0 & 12 & 0 & 12 & 0 \end{pmatrix}$$

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

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

22 . Coloring, {2, 5, 6}

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

\ See graph

[See pair graph](#)

,

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	5 vs 5	3 vs 4	3 vs 3

Omega Rank for R :

$$-t^{2+} t^4$$

, cycles: {{4, 6}} order: 2

$$\begin{pmatrix} 2 & 0 & 6 & 8 & 0 & 8 \\ 0 & 0 & 0 & 8 & 0 & 16 \\ 0 & 0 & 0 & 16 & 0 & 8 \\ 0 & 0 & 0 & 8 & 0 & 16 \end{pmatrix}$$

$$[y_1, 0, 3y_1, y_3, 0, y_2]$$

$$p = -s^{2+} s^4$$

Omega Rank for B :

$$-t^{2+} t^4$$

, cycles: {{5, 6}} order: 2

$$\begin{pmatrix} 0 & 4 & 0 & 0 & 12 & 8 \\ 0 & 0 & 0 & 0 & 8 & 16 \\ 0 & 0 & 0 & 0 & 16 & 8 \end{pmatrix}$$

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

23 . Coloring, {3, 4, 5}

$$R: [6, 6, 5, 2, 3, 5]$$

$$B: [5, 1, 6, 6, 6, 4]$$

[See graph](#)

[See pair graph](#)

,

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	4 vs 4	4 vs 4

Omega Rank for R :

$$-t^{3+} t^5$$

, cycles: {{3, 5}} order: 4

$$\begin{pmatrix} 0 & 4 & 6 & 0 & 11 & 3 \\ 0 & 0 & 11 & 0 & 9 & 4 \\ 0 & 0 & 9 & 0 & 15 & 0 \\ 0 & 0 & 15 & 0 & 9 & 0 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^3 + t^5$$

,
cycles: {{4, 6}} order: 4

$$\begin{pmatrix} 2 & 0 & 0 & 8 & 1 & 13 \\ 0 & 0 & 0 & 13 & 2 & 9 \\ 0 & 0 & 0 & 9 & 0 & 15 \\ 0 & 0 & 0 & 15 & 0 & 9 \end{pmatrix}$$

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

24 . Coloring, {3, 4, 6}

R: [6, 6, 5, 2, 6, 4]

B: [5, 1, 6, 6, 3, 5]

` See graph

` ` See pair graph

,

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	4 vs 4	4 vs 4

Omega Rank for R :

$$-t^2 + t^5$$

,
cycles: {{2, 4, 6}} order: 3

$$\begin{pmatrix} 0 & 4 & 0 & 8 & 3 & 9 \\ 0 & 8 & 0 & 9 & 0 & 7 \\ 0 & 9 & 0 & 7 & 0 & 8 \\ 0 & 7 & 0 & 8 & 0 & 9 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^2 + t^5$$

,
cycles: {{3, 5, 6}} order: 3

$$\begin{pmatrix} 2 & 0 & 6 & 0 & 9 & 7 \\ 0 & 0 & 9 & 0 & 9 & 6 \\ 0 & 0 & 9 & 0 & 6 & 9 \\ 0 & 0 & 6 & 0 & 9 & 9 \end{pmatrix}$$

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

25 . Coloring, {3, 5, 6}

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

` See graph

` ` See pair graph

`

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	2 vs 4	4 vs 4

Omega Rank for R :

$$-t^+ \quad t^3$$

,
 cycles: {{4, 6}, {3, 5}} order: 2

$$\begin{pmatrix} 0 & 0 & 6 & 8 & 3 & 7 \\ 0 & 0 & 3 & 7 & 6 & 8 \\ 0 & 0 & 6 & 8 & 3 & 7 \\ 0 & 0 & 3 & 7 & 6 & 8 \end{pmatrix}$$

$$[0, 0, 9y_1 - 6y_2, 5y_1, -6y_1 + 9y_2, 5y_2]$$

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

Omega Rank for B :

$$-t^3 \quad t^5$$

,
 cycles: {{5, 6}} order: 4

$$\begin{pmatrix} 2 & 4 & 0 & 0 & 9 & 9 \\ 4 & 0 & 0 & 0 & 11 & 9 \\ 0 & 0 & 0 & 0 & 13 & 11 \\ 0 & 0 & 0 & 0 & 11 & 13 \end{pmatrix}$$

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

26 . Coloring, {4, 5, 6}

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

` See graph

` ` See pair graph

`

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	5 vs 5	5 vs 5	4 vs 4	2 vs 3

Omega Rank for R :

$$-t^2 \quad t^5$$

,

cycles: {{2, 4, 6}} order: 3

$$\begin{pmatrix} 0 & 4 & 6 & 8 & 0 & 6 \\ 0 & 8 & 0 & 6 & 0 & 10 \\ 0 & 6 & 0 & 10 & 0 & 8 \\ 0 & 10 & 0 & 8 & 0 & 6 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^{2+} t^4$$

cycles: {{5, 6}} order: 2

$$\begin{pmatrix} 2 & 0 & 0 & 0 & 12 & 10 \\ 0 & 0 & 0 & 0 & 12 & 12 \\ 0 & 0 & 0 & 0 & 12 & 12 \end{pmatrix}$$

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

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

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

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

` See graph

`` See pair graph

,

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

Omega Rank for R :

$$-t^{4+} t^6$$

cycles: {{3, 5}} order: 4

$$\begin{pmatrix} 2 & 4 & 6 & 0 & 11 & 1 \\ 4 & 0 & 11 & 0 & 7 & 2 \\ 0 & 0 & 7 & 0 & 13 & 4 \\ 0 & 0 & 13 & 0 & 11 & 0 \\ 0 & 0 & 11 & 0 & 13 & 0 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^{2+} t^4$$

cycles: {{4, 6}} order: 2

0 0 0 8 1 15
 (0 0 0 15 0 9)
 0 0 0 9 0 15

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

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

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

` See graph

` ` See pair graph

`

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	5 vs 5	3 vs 3

Omega Rank for R :

$-t^2 + t^6$

' cycles: {{1, 2, 4, 6}} order: 4

2 4 0 8 3 7
 4 8 0 7 0 5
 (8 7 0 5 0 4)
 7 5 0 4 0 8
 5 4 0 8 0 7

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

Omega Rank for B :

$-t + t^4$

' cycles: {{3, 5, 6}} order: 3

0 0 6 0 9 9
 (0 0 9 0 9 6)
 0 0 9 0 6 9

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

29 . Coloring, {2, 3, 5, 6}

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

` See graph

` ` See pair graph

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	3 vs 5	3 vs 3

Omega Rank for R :

$$-t^{2+} t^4$$

' cycles: {{3, 5}, {4, 6}} order: 2

$$\begin{pmatrix} 2 & 0 & 6 & 8 & 3 & 5 \\ 0 & 0 & 3 & 5 & 6 & 10 \\ (0 & 0 & 6 & 10 & 3 & 5) \\ 0 & 0 & 3 & 5 & 6 & 10 \\ 0 & 0 & 6 & 10 & 3 & 5 \end{pmatrix}$$

$$[5 y_1 - 3 y_2, 0, 3 y_1, 3 y_2, 3 y_3, 5 y_3]$$

$$p' = -s^{2+} s^4 \quad p = -s^{2+} s^4$$

Omega Rank for B :

$$-t^{2+} t^4$$

' cycles: {{5, 6}} order: 2

$$\begin{pmatrix} 0 & 4 & 0 & 0 & 9 & 11 \\ (0 & 0 & 0 & 0 & 11 & 13) \\ 0 & 0 & 0 & 0 & 13 & 11 \end{pmatrix}$$

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

30 . Coloring, {2, 4, 5, 6}

$$\Omega p(\Delta)=0: \quad p = s^3 - 4s^5 \quad p' = s^{3+} 2s^4$$

$$R: [6, 1, 6, 2, 3, 4]$$

$$B: [5, 6, 5, 6, 6, 5]$$

` See graph

` ` See pair graph

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
3 vs 5	3 vs 5	3 vs 5	3 vs 5	1 vs 2

Omega Rank for R :

$$-t^{2+} t^6$$

' cycles: {{1, 2, 4, 6}} order: 4

2 4 6 8 0 4
 4 8 0 4 0 8
 (8 4 0 8 0 4)
 4 8 0 4 0 8
 8 4 0 8 0 4

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

$p' = s^2 - s^4 \quad p = s^2 - s^4$

Omega Rank for B :

$-t \quad t^3$

' cycles: {{5, 6}} order: 2

$\begin{pmatrix} 0 & 0 & 0 & 0 & 12 & 12 \\ 0 & 0 & 0 & 0 & 12 & 12 \end{pmatrix}$

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

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

M N

0 0 0 1 0 0 0 2 0 3 2 1
 0 0 0 0 0 2 2 0 2 1 0 3
 $\begin{pmatrix} 0 & 0 & 0 & 3 & 0 & 0 \\ 1 & 0 & 3 & 0 & 0 & 0 \end{pmatrix}$ $\begin{pmatrix} 0 & 2 & 0 & 3 & 2 & 1 \\ 3 & 1 & 3 & 0 & 1 & 2 \end{pmatrix}$
 0 0 0 0 0 6 2 0 2 1 0 3
 0 2 0 0 6 0 1 3 1 2 3 0

NM

3 2 9 0 6 16
 1 6 3 8 18 0
 $\begin{pmatrix} 3 & 2 & 9 & 0 & 6 & 16 \\ 0 & 4 & 0 & 12 & 12 & 8 \end{pmatrix}$
 1 6 3 8 18 0
 2 0 6 4 0 24

$\tau = 56 -- 3, r' = 1/2$

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

Ranges

Action of R on ranges, $\begin{bmatrix} [2] \\ [1] \\ [2] \\ [3] \end{bmatrix}$
 Action of B on ranges, $\begin{bmatrix} [4] \\ [4] \\ [4] \\ [4] \end{bmatrix}$

Cycles: R , {{1, 2, 4, 6}}, B , {{5, 6}}

$\beta(\{1, 4\}) = 1/12$
 $\beta(\{2, 6\}) = 1/6$
 $\beta(\{3, 4\}) = 1/4$
 $\beta(\{5, 6\}) = 1/2$

Partitions

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

$\alpha(\{\{1, 2, 3, 5\}, \{4, 6\}\}) = 1/3$
 $\alpha(\{\{1, 3, 6\}, \{2, 4, 5\}\}) = 2/3$

$b_1 = \{1, 3, 6\}$, $b_2 = \{2, 4, 5\}$, $b_3 = \{1, 2, 3, 5\}$, $b_4 = \{4, 6\}$

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

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

See level-2 partition graph.

Sandwich	
Coloring	{2, 4, 5, 6}
Rank	2
R,B	[6, 1, 6, 2, 3, 4], [5, 6, 5, 6, 6, 5]
π_2	[0, 0, 1, 0, 0, 0, 0, 0, 2, 3, 0, 0, 0, 0, 6]
u_2	[2, 0, 3, 2, 1, 2, 1, 0, 3, 3, 2, 1, 1, 2, 3] (dim 1)
wpp	[10, 10, 10, 8, 10, 8]

31 . Coloring, {3, 4, 5, 6}

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

See graph

See pair graph

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
5 vs 5	6 vs 6	6 vs 6	4 vs 5	3 vs 3

Omega Rank for R :

$-t - t^2 + t^4 + t^5$

cycles: {{2, 4, 6}, {3, 5}} order: 6

$$\begin{matrix} 0 & 4 & 6 & 8 & 3 & 3 \\ 0 & 8 & 3 & 3 & 6 & 4 \\ (0 & 3 & 6 & 4 & 3 & 8) \\ 0 & 4 & 3 & 8 & 6 & 3 \\ 0 & 8 & 6 & 3 & 3 & 4 \end{matrix}$$

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

$$p = -s - s^{2^T} s^{4^T} s^5$$

Omega Rank for B :
 $-t^{2^+} t^4$

' cycles: {{5, 6}} order: 2

$$\begin{pmatrix} 2 & 0 & 0 & 0 & 9 & 13 \\ 0 & 0 & 0 & 0 & 15 & 9 \\ 0 & 0 & 0 & 0 & 9 & 15 \end{pmatrix}$$

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

32 . Coloring, {2, 3, 4, 5, 6}

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

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

- ` See graph
- `` See pair graph
- `

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 5	5 vs 6	5 vs 6	4 vs 6	2 vs 2

Omega Rank for R :
 $-1 t^4$

' cycles: {{1, 2, 4, 6}, {3, 5}} order: 4

$$\begin{pmatrix} 2 & 4 & 6 & 8 & 3 & 1 \\ 4 & 8 & 3 & 1 & 6 & 2 \\ 8 & 1 & 6 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 & 6 & 8 \\ 2 & 4 & 6 & 8 & 3 & 1 \\ 4 & 8 & 3 & 1 & 6 & 2 \end{pmatrix}$$

$$[3 y_2, 5 y_4 - 3 y_3, 3 y_1, -3 y_2 + 5 y_1, 3 y_4, 3 y_3]$$

$$p' = 1 - s^4 \quad p' = s - s^5$$

Omega Rank for B :
 $-t t^3$

' cycles: {{5, 6}} order: 2

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 9 & 15 \\ 0 & 0 & 0 & 0 & 15 & 9 \end{pmatrix}$$

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

SUMMARY	
Graph Type	CC
$v(A)$	1
$v(\Delta)$	1
π	[1, 2, 3, 4, 6, 8]
Dbly Stoch	false

SANDWICH		Total 1
No .	Coloring	Rank
1	{2, 4, 5, 6}	2

RT GROUPS		Total 2	
No .	Coloring	Rank	Solv
1	{2, 5}	3	Solvable
2	{4}	2	Solvable

Δ -RANK'D	SC'D !RK'D	τ -RANK'D	R/B RANK'D	NOT SYNC'D	Total Runs	2^{n-1}
27	0	28 , 26	23 , 22	3	32	32