

New Graph

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

$$\pi = [5, 6, 12, 10, 15, 24]$$

$$\delta = [1, 1, 1, 2, 2, 5]$$

POSSIBLE RANKS

- 1 x 72
- 2 x 36
- 3 x 24
- 4 x 18
- 6 x 12
- 8 x 9

BASE DETERMINANT 2035/16384, .1242065430

NullSpace of Δ

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

Nullspace of A

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

1 . Coloring, {}

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

` 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

Omega Rank for R :

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

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

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 24 & 48 \\ 0 & 0 & 0 & 0 & 48 & 24 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{matrix} 10 & 12 & 24 & 20 & 6 & 0 \\ 20 & 24 & 0 & 16 & 12 & 0 \\ (16 & 0 & 0 & 32 & 24 & 0) \\ 32 & 0 & 0 & 40 & 0 & 0 \\ 40 & 0 & 0 & 32 & 0 & 0 \end{matrix}$$

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

2. Coloring, {2}

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

` 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	4 vs 5

Omega Rank for R :

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

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

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 30 & 42 \\ 0 & 0 & 0 & 0 & 42 & 30 \end{pmatrix}$$

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

Omega Rank for B :

$$-t - t^2 \quad t^4 \quad t^5$$

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

$$\begin{matrix} 10 & 12 & 24 & 20 & 0 & 6 \\ 20 & 24 & 6 & 10 & 0 & 12 \\ (10 & 6 & 12 & 20 & 0 & 24) \\ 20 & 12 & 24 & 10 & 0 & 6 \\ 10 & 24 & 6 & 20 & 0 & 12 \end{matrix}$$

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

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

3. Coloring, {3}

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

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

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

` See graph

` ` See pair graph

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

Omega Rank for R :

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

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

$$\begin{pmatrix} 0 & 12 & 0 & 0 & 24 & 36 \\ 0 & 0 & 0 & 0 & 36 & 36 \\ 0 & 0 & 0 & 0 & 36 & 36 \end{pmatrix}$$

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

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 10 & 0 & 24 & 20 & 6 & 12 \\ 20 & 0 & 12 & 16 & 0 & 24 \\ 16 & 0 & 24 & 20 & 0 & 12 \\ 20 & 0 & 12 & 16 & 0 & 24 \\ 16 & 0 & 24 & 20 & 0 & 12 \end{pmatrix}$$

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

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

M N

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

NM

$$\begin{pmatrix} 5 & 6 & 0 & 10 & 15 & 0 \\ 5 & 6 & 0 & 10 & 15 & 0 \\ 0 & 0 & 12 & 0 & 0 & 24 \\ 5 & 6 & 0 & 10 & 15 & 0 \\ 5 & 6 & 0 & 10 & 15 & 0 \\ 0 & 0 & 12 & 0 & 0 & 24 \end{pmatrix}$$

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

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

Ranges

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

Cycles: R, {{5, 6}}, B, {{1, 4}, {3, 6}}

$\beta(\{1, 3\}) = 1/36$
 $\beta(\{1, 6\}) = 1/9$
 $\beta(\{2, 6\}) = 1/6$
 $\beta(\{3, 4\}) = 2/9$
 $\beta(\{3, 5\}) = 1/12$
 $\beta(\{4, 6\}) = 1/18$
 $\beta(\{5, 6\}) = 1/3$

Partitions

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

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

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.

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Right Group	
Coloring	{3}
Rank	2
R,B	[6, 6, 2, 6, 6, 5], [4, 5, 6, 1, 4, 3]
π_2	[0, 1, 0, 0, 4, 0, 0, 0, 6, 8, 3, 0, 0, 2, 12]
u_2	[0, 1, 0, 0, 1, 1, 0, 0, 1, 1, 1, 0, 0, 1, 1] (dim 1)
wpp	[4, 4, 2, 4, 4, 2]

4. Coloring, {4}

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

See graph

See pair graph

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

$$-t^2 \quad t^4$$

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

$$\begin{pmatrix} 10 & 0 & 0 & 0 & 24 & 38 \\ 0 & 0 & 0 & 0 & 38 & 34 \\ 0 & 0 & 0 & 0 & 34 & 38 \end{pmatrix}$$

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

Omega Rank for B :

$$-t \quad t^6$$

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

$$\begin{pmatrix} 0 & 12 & 24 & 20 & 6 & 10 \\ 0 & 24 & 10 & 6 & 12 & 20 \\ 0 & 10 & 20 & 12 & 24 & 6 \\ 0 & 20 & 6 & 24 & 10 & 12 \\ 0 & 6 & 12 & 10 & 20 & 24 \end{pmatrix}$$

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

5 . Coloring, {5}

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

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

` See graph

` ` See pair graph

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

Omega Rank for R :

$$-t \quad t^4$$

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

$$\begin{pmatrix} 0 & 0 & 0 & 15 & 24 & 33 \\ 0 & 0 & 0 & 24 & 33 & 15 \\ 0 & 0 & 0 & 33 & 15 & 24 \end{pmatrix}$$

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

Omega Rank for B :

$$-1 \quad t^4$$

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

$$\begin{pmatrix} 10 & 12 & 24 & 5 & 6 & 15 \\ 5 & 24 & 15 & 10 & 12 & 6 \\ 10 & 15 & 6 & 5 & 24 & 12 \\ 5 & 6 & 12 & 10 & 15 & 24 \\ 10 & 12 & 24 & 5 & 6 & 15 \\ 5 & 24 & 15 & 10 & 12 & 6 \end{pmatrix}$$

$$[5y_1, 8y_1 + 11y_2 - 5y_3, 11y_1 + 8y_2 - 5y_4, 5y_2, 5y_4, 5y_3]$$

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

6. Coloring, {6}

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

$$-t + t^3$$

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

$$\begin{pmatrix} 0 & 0 & 24 & 0 & 0 & 48 \\ 0 & 0 & 48 & 0 & 0 & 24 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 10 & 12 & 0 & 20 & 30 & 0 \\ 20 & 0 & 0 & 40 & 12 & 0 \\ 40 & 0 & 0 & 32 & 0 & 0 \\ 32 & 0 & 0 & 40 & 0 & 0 \end{pmatrix}$$

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

7. Coloring, {2, 3}

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

` 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	2 vs 4

Omega Rank for R :

$$-t^2 \quad t^4$$

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

$$\begin{pmatrix} 0 & 12 & 0 & 0 & 30 & 30 \\ 0 & 0 & 0 & 0 & 42 & 30 \\ 0 & 0 & 0 & 0 & 30 & 42 \end{pmatrix}$$

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

Omega Rank for B :

$$-t \quad t^3$$

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

$$\begin{pmatrix} 10 & 0 & 24 & 20 & 0 & 18 \\ 20 & 0 & 18 & 10 & 0 & 24 \\ 10 & 0 & 24 & 20 & 0 & 18 \\ 20 & 0 & 18 & 10 & 0 & 24 \end{pmatrix}$$

$$[10 y_1, 0, -21 y_1 + 25 y_2, -25 y_1 + 25 y_2, 0, 10 y_2]$$

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

8 . Coloring, {2, 4}

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

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

` 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 :

$$-t^2 \quad t^4$$

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

$$\begin{pmatrix} 10 & 0 & 0 & 0 & 30 & 32 \\ 0 & 0 & 0 & 0 & 32 & 40 \\ 0 & 0 & 0 & 0 & 40 & 32 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 0 & 12 & 24 & 20 & 0 & 16 \\ 0 & 24 & 16 & 0 & 0 & 32 \\ 0 & 16 & 32 & 0 & 0 & 24 \\ 0 & 32 & 24 & 0 & 0 & 16 \end{pmatrix}$$

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

9 . Coloring, {2, 5}

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

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

` 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	4 vs 5

Omega Rank for R :

$$-t + t^4$$

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

$$\begin{pmatrix} 0 & 0 & 0 & 15 & 30 & 27 \\ 0 & 0 & 0 & 30 & 27 & 15 \\ 0 & 0 & 0 & 27 & 15 & 30 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 10 & 12 & 24 & 5 & 0 & 21 \\ 5 & 24 & 21 & 10 & 0 & 12 \\ 10 & 21 & 12 & 5 & 0 & 24 \\ 5 & 12 & 24 & 10 & 0 & 21 \\ 10 & 24 & 21 & 5 & 0 & 12 \end{pmatrix}$$

$$[5 y_1, 19 y_1 - 5 y_2 + 19 y_3 - 5 y_4, 5 y_2, 5 y_3, 0, 5 y_4]$$

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

10 . Coloring, {2, 6}

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

Omega Rank for R :

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

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

0 0 24 0 6 42
 (0 0 42 0 0 30)
 0 0 30 0 0 42

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

Omega Rank for B :

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

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

10 12 0 20 24 6
 20 0 0 34 6 12
 (34 0 0 26 12 0)
 26 0 0 46 0 0
 46 0 0 26 0 0

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

11 . Coloring, {3, 4}

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

` 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 4	4 vs 4

Omega Rank for R :

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

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

$$\begin{pmatrix} 10 & 12 & 0 & 0 & 24 & 26 \\ 0 & 0 & 0 & 0 & 26 & 46 \\ 0 & 0 & 0 & 0 & 46 & 26 \\ 0 & 0 & 0 & 0 & 26 & 46 \end{pmatrix}$$

$$[5y_1, 6y_1, 0, 0, 5y_2, 5y_3]$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 0 & 0 & 24 & 20 & 6 & 22 \\ 0 & 0 & 22 & 6 & 0 & 44 \\ 0 & 0 & 44 & 0 & 0 & 28 \\ 0 & 0 & 28 & 0 & 0 & 44 \end{pmatrix}$$

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

12 . Coloring, {3, 5}

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

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

` 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	3 vs 5

Omega Rank for R :

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

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

$$\begin{pmatrix} 0 & 12 & 0 & 15 & 24 & 21 \\ 0 & 0 & 0 & 24 & 21 & 27 \\ 0 & 0 & 0 & 21 & 27 & 24 \\ 0 & 0 & 0 & 27 & 24 & 21 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 10 & 0 & 24 & 5 & 6 & 27 \\ 5 & 0 & 27 & 10 & 0 & 30 \\ (10 & 0 & 30 & 5 & 0 & 27) \\ 5 & 0 & 27 & 10 & 0 & 30 \\ 10 & 0 & 30 & 5 & 0 & 27 \end{pmatrix}$$

$$[5y_1, 0, 11y_1 + 8y_2 - 5y_3, 5y_2, 5y_3, 8y_1 + 11y_2]$$

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

13 . Coloring, {3, 6}

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

` See graph
 `` See pair graph

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

Omega Rank for R :

$$-t + t^4$$

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

$$\begin{pmatrix} 0 & 12 & 24 & 0 & 0 & 36 \\ (0 & 24 & 36 & 0 & 0 & 12) \\ 0 & 36 & 12 & 0 & 0 & 24 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 10 & 0 & 0 & 20 & 30 & 12 \\ 20 & 0 & 0 & 40 & 12 & 0 \\ (40 & 0 & 0 & 32 & 0 & 0) \\ 32 & 0 & 0 & 40 & 0 & 0 \end{pmatrix}$$

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

14 . Coloring, {4, 5}

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

\ 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	5 vs 5

Omega Rank for R :

$$-t^+ \quad t^5$$

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

$$\begin{pmatrix} 10 & 0 & 0 & 15 & 24 & 23 \\ 15 & 0 & 0 & 24 & 23 & 10 \\ 24 & 0 & 0 & 23 & 10 & 15 \\ 23 & 0 & 0 & 10 & 15 & 24 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 0 & 12 & 24 & 5 & 6 & 25 \\ 0 & 24 & 25 & 0 & 12 & 11 \\ 0 & 25 & 11 & 0 & 24 & 12 \\ 0 & 11 & 12 & 0 & 25 & 24 \\ 0 & 12 & 24 & 0 & 11 & 25 \end{pmatrix}$$

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

15 . Coloring, {4, 6}

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

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

\ 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 :

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

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

$$\begin{pmatrix} 10 & 0 & 24 & 0 & 0 & 38 \\ 0 & 0 & 38 & 0 & 0 & 34 \\ 0 & 0 & 34 & 0 & 0 & 38 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 0 & 12 & 0 & 20 & 30 & 10 \\ 0 & 0 & 0 & 30 & 22 & 20 \\ 0 & 0 & 0 & 22 & 20 & 30 \\ 0 & 0 & 0 & 20 & 30 & 22 \end{pmatrix}$$

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

16 . Coloring, {5, 6}

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

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

` See graph

` ` See pair graph

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

Omega Rank for R :

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

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

$$\begin{pmatrix} 0 & 0 & 24 & 15 & 0 & 33 \\ 0 & 0 & 33 & 0 & 0 & 39 \\ 0 & 0 & 39 & 0 & 0 & 33 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 10 & 12 & 0 & 5 & 30 & 15 \\ 5 & 0 & 0 & 10 & 27 & 30 \\ 10 & 0 & 0 & 5 & 30 & 27 \\ 5 & 0 & 0 & 10 & 27 & 30 \\ 10 & 0 & 0 & 5 & 30 & 27 \end{pmatrix}$$

$$[5 y_1, 5 y_2, 0, 5 y_3, 11 y_1 + 8 y_3, 8 y_1 - 5 y_2 + 11 y_3]$$

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

17 . Coloring, {2, 3, 4}

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

` 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 4	3 vs 3

Omega Rank for R :

tailcheck $-t^2 + t^4$

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

$$\begin{pmatrix} 10 & 12 & 0 & 0 & 30 & 20 \\ 0 & 0 & 0 & 0 & 32 & 40 \\ 0 & 0 & 0 & 0 & 40 & 32 \\ 0 & 0 & 0 & 0 & 32 & 40 \end{pmatrix}$$

$$[5 y_3, 6 y_3, 0, 0, 5 y_1, 5 y_2]$$

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

Omega Rank for B :

$-t^2 + t^4$

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

$$\begin{pmatrix} 0 & 0 & 24 & 20 & 0 & 28 \\ 0 & 0 & 28 & 0 & 0 & 44 \\ 0 & 0 & 44 & 0 & 0 & 28 \end{pmatrix}$$

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

18 . Coloring, {2, 3, 5}

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

` 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	2 vs 4

Omega Rank for R :

$-t^2 + t^5$

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

$$\begin{pmatrix} 0 & 12 & 0 & 15 & 30 & 15 \\ 0 & 0 & 0 & 30 & 27 & 15 \\ 0 & 0 & 0 & 27 & 15 & 30 \\ 0 & 0 & 0 & 15 & 30 & 27 \end{pmatrix}$$

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

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

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

$$\begin{pmatrix} 10 & 0 & 24 & 5 & 0 & 33 \\ 5 & 0 & 33 & 10 & 0 & 24 \\ 10 & 0 & 24 & 5 & 0 & 33 \\ 5 & 0 & 33 & 10 & 0 & 24 \end{pmatrix}$$

$$[25 y_2 - 70 y_1, 0, 25 y_2, 25 y_1, 0, -171 y_1 + 70 y_2]$$

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

19 . Coloring, {2, 3, 6}

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

Omega Rank for R :
 $-t^+ t^5$

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

$$\begin{pmatrix} 0 & 12 & 24 & 0 & 6 & 30 \\ 0 & 24 & 30 & 0 & 12 & 6 \\ 0 & 30 & 6 & 0 & 24 & 12 \\ 0 & 6 & 12 & 0 & 30 & 24 \end{pmatrix}$$

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

Omega Rank for B :
 $-t^{3+} t^5$

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

$$\begin{pmatrix} 10 & 0 & 0 & 20 & 24 & 18 \\ 20 & 0 & 0 & 34 & 18 & 0 \\ 34 & 0 & 0 & 38 & 0 & 0 \\ 38 & 0 & 0 & 34 & 0 & 0 \end{pmatrix}$$

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

20 . Coloring, {2, 4, 5}

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

` 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 :

$$-t^+ t^5$$

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

$$\begin{pmatrix} 10 & 0 & 0 & 15 & 30 & 17 \\ 15 & 0 & 0 & 30 & 17 & 10 \\ 30 & 0 & 0 & 17 & 10 & 15 \\ 17 & 0 & 0 & 10 & 15 & 30 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 0 & 12 & 24 & 5 & 0 & 31 \\ 0 & 24 & 31 & 0 & 0 & 17 \\ 0 & 31 & 17 & 0 & 0 & 24 \\ 0 & 17 & 24 & 0 & 0 & 31 \end{pmatrix}$$

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

21 . Coloring, {2, 4, 6}

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

Omega Rank for R :

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

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

$$\begin{pmatrix} 10 & 0 & 24 & 0 & 6 & 32 \\ 0 & 0 & 32 & 0 & 0 & 40 \\ 0 & 0 & 40 & 0 & 0 & 32 \\ 0 & 0 & 32 & 0 & 0 & 40 \end{pmatrix}$$

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

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 0 & 12 & 0 & 20 & 24 & 16 \\ 0 & 0 & 0 & 24 & 16 & 32 \\ 0 & 0 & 0 & 16 & 32 & 24 \\ 0 & 0 & 0 & 32 & 24 & 16 \end{pmatrix}$$

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

22 . Coloring, {2, 5, 6}

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

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

` 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 4	3 vs 5

Omega Rank for R :

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

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

$$\begin{pmatrix} 0 & 0 & 24 & 15 & 6 & 27 \\ 0 & 0 & 27 & 6 & 0 & 39 \\ 0 & 0 & 39 & 0 & 0 & 33 \\ 0 & 0 & 33 & 0 & 0 & 39 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^2 \quad t^4$$

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

$$\begin{pmatrix} 10 & 12 & 0 & 5 & 24 & 21 \\ 5 & 0 & 0 & 10 & 21 & 36 \\ 10 & 0 & 0 & 5 & 36 & 21 \\ 5 & 0 & 0 & 10 & 21 & 36 \\ 10 & 0 & 0 & 5 & 36 & 21 \end{pmatrix}$$

$$[-17 y_1 + 5 y_3, 2 y_2, 0, 2 y_1, -2 y_2 - 57 y_1 + 17 y_3, 2 y_3]$$

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

23 . Coloring, {3, 4, 5}

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

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

[` 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 4

Omega Rank for R :

$$-t^2 \quad t^6$$

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

$$\begin{pmatrix} 10 & 12 & 0 & 15 & 24 & 11 \\ 15 & 0 & 0 & 24 & 11 & 22 \\ 24 & 0 & 0 & 11 & 22 & 15 \\ 11 & 0 & 0 & 22 & 15 & 24 \\ 22 & 0 & 0 & 15 & 24 & 11 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 0 & 0 & 24 & 5 & 6 & 37 \\ 0 & 0 & 37 & 0 & 0 & 35 \\ 0 & 0 & 35 & 0 & 0 & 37 \\ 0 & 0 & 37 & 0 & 0 & 35 \end{pmatrix}$$

$$[0, 0, 5y_3, 5y_1, 6y_1, 5y_2]$$

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

24 . Coloring, {3, 4, 6}

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

Omega Rank for R :

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

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

$$\begin{pmatrix} 10 & 12 & 24 & 0 & 0 & 26 \\ 0 & 24 & 26 & 0 & 0 & 22 \\ 0 & 26 & 22 & 0 & 0 & 24 \\ 0 & 22 & 24 & 0 & 0 & 26 \end{pmatrix}$$

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

Omega Rank for B :

$$-t \quad t^4$$

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

$$\begin{pmatrix} 0 & 0 & 0 & 20 & 30 & 22 \\ 0 & 0 & 0 & 30 & 22 & 20 \\ 0 & 0 & 0 & 22 & 20 & 30 \end{pmatrix}$$

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

25 . Coloring, {3, 5, 6}

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

Omega Rank for R :

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

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

$$\begin{pmatrix} 0 & 12 & 24 & 15 & 0 & 21 \\ 0 & 24 & 21 & 0 & 0 & 27 \\ 0 & 21 & 27 & 0 & 0 & 24 \\ 0 & 27 & 24 & 0 & 0 & 21 \end{pmatrix}$$

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

Omega Rank for B :

$$-t \quad t^3$$

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

$$\begin{pmatrix} 10 & 0 & 0 & 5 & 30 & 27 \\ 5 & 0 & 0 & 10 & 27 & 30 \\ 10 & 0 & 0 & 5 & 30 & 27 \\ 5 & 0 & 0 & 10 & 27 & 30 \end{pmatrix}$$

$$[5 y_1, 0, 0, 5 y_2, 11 y_1 + 8 y_2, 8 y_1 + 11 y_2]$$

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

26 . Coloring, {4, 5, 6}

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

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

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 4	3 vs 4

Omega Rank for R :

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

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

$$\begin{pmatrix} 10 & 0 & 24 & 15 & 0 & 23 \\ 15 & 0 & 23 & 0 & 0 & 34 \\ 0 & 0 & 34 & 0 & 0 & 38 \\ 0 & 0 & 38 & 0 & 0 & 34 \end{pmatrix}$$

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

Omega Rank for B :

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

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

$$\begin{pmatrix} 0 & 12 & 0 & 5 & 30 & 25 \\ 0 & 0 & 0 & 0 & 37 & 35 \\ 0 & 0 & 0 & 0 & 35 & 37 \\ 0 & 0 & 0 & 0 & 37 & 35 \end{pmatrix}$$

$$[0, 12 y_1, 0, 5 y_1, 5 y_2, 5 y_3]$$

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

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

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

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

[` 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, 4, 5, 6}} order: 4

$$\begin{pmatrix} 10 & 12 & 0 & 15 & 30 & 5 \\ 15 & 0 & 0 & 30 & 17 & 10 \\ (30 & 0 & 0 & 17 & 10 & 15) \\ 17 & 0 & 0 & 10 & 15 & 30 \\ 10 & 0 & 0 & 15 & 30 & 17 \end{pmatrix}$$

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

Omega Rank for B :

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

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

0 0 24 5 0 43
 (0 0 43 0 0 29)
 0 0 29 0 0 43

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

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

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

Omega Rank for R :

$-t^2 + t^6$

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

10 12 24 0 6 20
 0 24 20 0 12 16
 (0 20 16 0 24 12)
 0 16 12 0 20 24
 0 12 24 0 16 20

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

Omega Rank for B :

$-t + t^4$

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

0 0 0 20 24 28
 (0 0 0 24 28 20)
 0 0 0 28 20 24

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

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

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

Omega Rank for R :

$$-t^+ t^6$$

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

$$\begin{pmatrix} 0 & 12 & 24 & 15 & 6 & 15 \\ 0 & 24 & 15 & 6 & 12 & 15 \\ 0 & 15 & 15 & 12 & 24 & 6 \\ 0 & 15 & 6 & 24 & 15 & 12 \\ 0 & 6 & 12 & 15 & 15 & 24 \end{pmatrix}$$

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

Omega Rank for B :

$$-t^+ t^3$$

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

$$\begin{pmatrix} 10 & 0 & 0 & 5 & 24 & 33 \\ 5 & 0 & 0 & 10 & 33 & 24 \\ 10 & 0 & 0 & 5 & 24 & 33 \\ 5 & 0 & 0 & 10 & 33 & 24 \end{pmatrix}$$

$$[25 y_1, 0, 0, -70 y_1 + 25 y_2, -171 y_1 + 70 y_2, 25 y_2]$$

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

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

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

Omega Rank for R :

$$-t^4 t^6$$

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

10 0 24 15 6 17
 15 0 17 6 0 34
 (6 0 34 0 0 32)
 0 0 32 0 0 40
 0 0 40 0 0 32

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

Omega Rank for B :

tailcheck $-t^2 + t^4$

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

0 12 0 5 24 31
 0 0 0 0 31 41
 (0 0 0 0 41 31)
 0 0 0 0 31 41

$[0, 12 y_1, 0, 5 y_1, 5 y_3, 5 y_2]$

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

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

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

B: [4, 5, 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	5 vs 5	3 vs 3

Omega Rank for R :

$-t^3 + t^6$

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

10 12 24 15 0 11
 15 24 11 0 0 22
 (0 11 22 0 0 39)
 0 22 39 0 0 11
 0 39 11 0 0 22

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

Omega Rank for B :

$-t^2 + t^4$

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

0 0 0 5 30 37
 (0 0 0 0 37 35)
 0 0 0 0 35 37

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

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

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

Omega Rank for R :

$-1 \quad t^6$

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

10 12 24 15 6 5
 15 24 5 6 12 10
 (6 5 10 12 24 15)
 12 10 15 24 5 6
 24 15 6 5 10 12
 5 6 12 10 15 24

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

Omega Rank for B :

$-t^2 \quad t^4$

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

0 0 0 5 24 43
 (0 0 0 0 43 29)
 0 0 0 0 29 43

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

SUMMARY	
Graph Type	CC

$v(A)$	1
$v(\Delta)$	1
π	[5, 6, 12, 10, 15, 24]
Dbly Stoch	false

SANDWICH		Total 0
No .	Coloring	Rank

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

Δ -RANK'D	SC'D !RK'D	τ -RANK'D	R/B RANK'D	NOT SYNC'D	Total Runs	2^{n-1}
31	0	31, 30	28, 18	1	32	32
