

New Graph

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

$$\pi = [6, 3, 5, 6, 4, 3]$$

POSSIBLE RANKS

$$\begin{array}{l} 1 \times 27 \\ 3 \times 9 \end{array}$$

BASE DETERMINANT 161757/1048576, .1542634964

NullSpace of Δ

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

Nullspace of A

$$\det(A) = 1/32$$

1. Coloring, {}

$$\Omega p(\Delta)=0: \quad p' = s - 12s^3 + 16s^4 \quad p = s - 32s^4 + 48s^5 \quad p' = s^2 - 4s^3 + 4s^4$$

R: [4, 5, 1, 3, 1, 4]

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

‘ See graph

‘ ‘ See pair graph

‘

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

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

See Matrix

$$\$ [[9, 0, 6, 9, 3, 0], [9, 0, 9, 9, 0, 0], [9, 0, 9, 9, 0, 0], [9, 0, 9, 9, 0, 0]] \$$$

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

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

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

See Matrix

$$\$ [[3, 6, 4, 3, 5, 6], [6, 3, 5, 6, 4, 3], [3, 6, 4, 3, 5, 6], [6, 3, 5, 6, 4, 3], [3, 6, 4, 3, 5, 6], [6, 3, 5, 6, 4, 3]] \$$$

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

$$p' = -s + s^3 \quad p' = -1 + s^4 \quad p' = -s + s^5 \quad p' = -1 + s^2$$

‘ See 3-level graph

‘

M N

$$\$ [[0, 0, 4, 6, 2, 0], [0, 0, 1, 0, 2, 3], [4, 1, 0, 4, 0, 1], [6, 0, 4, 0, 2, 0], [2, 2, 0, 2, 0, 2], [0, 3, 1, 0, 2, 0]] \$$$

$$\$ [[0, 2, 3, 3, 3, 1], [2, 0, 3, 1, 3, 3], [3, 3, 0, 3, 0, 3], [3, 1, 3, 0, 3, 2], [3, 3, 0, 3, 0, 3], [1, 3, 3, 2, 3, 0]] \$$$

$$\tau = 12, r' = 2/3$$

$$\mathbf{R}: [4, 5, 1, 3, 1, 4]$$

$$\mathbf{B}: [2, 4, 5, 6, 3, 1]$$

Ranges

Action of R on ranges, $[[1], [1], [2], [2]]$

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

Cycles: R, $\{\{1, 3, 4\}\}$, B, $\{\{3, 5\}, \{1, 2, 4, 6\}\}$

$$\beta(\{1, 3, 4\}) = 4/9$$

$$\beta(\{1, 4, 5\}) = 2/9$$

$$\beta(\{2, 3, 6\}) = 1/9$$

$$\beta(\{2, 5, 6\}) = 2/9$$

Partitions

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

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

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

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

$$b1 = \{2, 4\} \text{ ' , ' } b2 = \{1, 2\} \text{ ' , ' } b3 = \{3, 5\} \text{ ' , ' } b4 = \{4, 6\} \text{ ' , ' } b5 = \{1, 6\}$$

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

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

' ' See level-3 partition graph.

'

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

2 . Coloring, {2}

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

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

' 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 : cycles: $\{\{1, 3, 4\}\}$ order: 3
 See Matrix

$$\$ [[9, 0, 6, 12, 0, 0] , [6, 0, 12, 9, 0, 0] , [12, 0, 9, 6, 0, 0]] \$$$

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

Omega Rank for B : cycles: $\{\{3, 5\}\}$ order: 4
 See Matrix

$$\$ [[3, 6, 4, 0, 8, 6] , [6, 3, 8, 0, 10, 0] , [0, 6, 10, 0, 11, 0] , [0, 0, 11, 0, 16, 0] , [0, 0, 16, 0, 11, 0]] \$$$

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

3 . Coloring, $\{3\}$

R: [4, 5, 5, 3, 1, 4]

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

‘ 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 | 5 vs 5 |

Omega Rank for R : cycles: $\{\{1, 3, 4, 5\}\}$ order: 4
 See Matrix

$$\$ [[4, 0, 6, 9, 8, 0] , [8, 0, 9, 4, 6, 0] , [6, 0, 4, 8, 9, 0] , [9, 0, 8, 6, 4, 0]] \$$$

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

Omega Rank for B : cycles: $\{\{1, 2, 4, 6\}\}$ order: 4
 See Matrix

$$\$ [[8, 6, 4, 3, 0, 6] , [10, 8, 0, 6, 0, 3] , [3, 10, 0, 8, 0, 6] , [6, 3, 0, 10, 0, 8] , [8, 6, 0, 3, 0, 10]] \$$$

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

4 . Coloring, {4}

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

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

‘ 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 | 5 vs 5 |

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

See Matrix

$\$ [[9, 0, 0, 9, 3, 6], [3, 0, 0, 15, 0, 9], [0, 0, 0, 12, 0, 15], [0, 0, 0, 15, 0, 12]] \$$

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

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

See Matrix

$\$ [[3, 6, 10, 3, 5, 0], [0, 3, 8, 6, 10, 0], [0, 0, 16, 3, 8, 0], [0, 0, 11, 0, 16, 0], [0, 0, 16, 0, 11, 0]] \$$

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

5 . Coloring, {5}

R: [4, 5, 1, 3, 3, 4]

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

‘ 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 | 5 vs 5 |

Omega Rank for R : cycles: $\{\{1, 3, 4\}\}$ order: 3
 See Matrix

$$\$ [[5, 0, 10, 9, 3, 0] , [10, 0, 12, 5, 0, 0] , [12, 0, 5, 10, 0, 0] , [5, 0, 10, 12, 0, 0]] \$$$

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

Omega Rank for B : cycles: $\{\{1, 2, 4, 6\}\}$ order: 4
 See Matrix

$$\$ [[7, 6, 0, 3, 5, 6] , [11, 7, 0, 6, 0, 3] , [3, 11, 0, 7, 0, 6] , [6, 3, 0, 11, 0, 7] , [7, 6, 0, 3, 0, 11]] \$$$

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

6 . Coloring, $\{6\}$

R: [4, 5, 1, 3, 1, 1]

B: [2, 4, 5, 6, 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 | 4 vs 4 | 3 vs 5 |

Omega Rank for R : cycles: $\{\{1, 3, 4\}\}$ order: 3
 See Matrix

$$\$ [[12, 0, 6, 6, 3, 0] , [9, 0, 6, 12, 0, 0] , [6, 0, 12, 9, 0, 0] , [12, 0, 9, 6, 0, 0]] \$$$

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

Omega Rank for B : cycles: $\{\{3, 5\}, \{4, 6\}\}$ order: 2
 See Matrix

$$\$ [[0, 6, 4, 6, 5, 6] , [0, 0, 5, 12, 4, 6] , [0, 0, 4, 6, 5, 12] , [0, 0, 5, 12, 4, 6] , [0, 0, 4, 6, 5, 12]] \$$$

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

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

7 . Coloring, {2, 3}

R: [4, 4, 5, 3, 1, 4]

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

‘ 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 | 5 vs 5 |

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

See Matrix

$$\$ [[4, 0, 6, 12, 5, 0], [5, 0, 12, 4, 6, 0], [6, 0, 4, 5, 12, 0], [12, 0, 5, 6, 4, 0]] \$$$

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

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

See Matrix

$$\$ [[8, 6, 4, 0, 3, 6], [10, 8, 3, 0, 6, 0], [3, 10, 6, 0, 8, 0], [6, 3, 8, 0, 10, 0], [8, 6, 10, 0, 3, 0]] \$$$

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

8 . Coloring, {2, 4}

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

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

‘ 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 | 4 vs 4 |

Omega Rank for R : cycles: {{4, 6}} order: 2
See Matrix

$$\$ [[9, 0, 0, 12, 0, 6], [0, 0, 0, 15, 0, 12], [0, 0, 0, 12, 0, 15]] \$$$

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

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

$$\$ [[3, 6, 10, 0, 8, 0], [0, 3, 8, 0, 16, 0], [0, 0, 16, 0, 11, 0], [0, 0, 11, 0, 16, 0]] \$$$

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

9. Coloring, {2, 5}

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

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

‘ 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 | 4 vs 4 |

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

$$\$ [[5, 0, 10, 12, 0, 0], [10, 0, 12, 5, 0, 0], [12, 0, 5, 10, 0, 0]] \$$$

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

Omega Rank for B : cycles: $\{\{1, 2, 5\}\}$ order: 3
 See Matrix

$$\$ [[7, 6, 0, 0, 8, 6], [14, 7, 0, 0, 6, 0], [6, 14, 0, 0, 7, 0], [7, 6, 0, 0, 14, 0]] \$$$

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

10 . Coloring, $\{2, 6\}$

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

B: [2, 5, 5, 6, 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 | 3 vs 5 |

Omega Rank for R : cycles: $\{\{1, 3, 4\}\}$ order: 3
 See Matrix

$$\$ [[12, 0, 6, 9, 0, 0], [6, 0, 9, 12, 0, 0], [9, 0, 12, 6, 0, 0]] \$$$

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

Omega Rank for B : cycles: $\{\{3, 5\}, \{4, 6\}\}$ order: 2
 See Matrix

$$\$ [[0, 6, 4, 3, 8, 6], [0, 0, 8, 6, 10, 3], [0, 0, 10, 3, 8, 6], [0, 0, 8, 6, 10, 3], [0, 0, 10, 3, 8, 6]] \$$$

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

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

11 . Coloring, $\{3, 4\}$

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

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

‘ 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 : cycles: {{4, 6}} order: 4

See Matrix

$$\$ [[4, 0, 0, 9, 8, 6], [8, 0, 0, 10, 0, 9], [0, 0, 0, 17, 0, 10], [0, 0, 0, 10, 0, 17]] \$$$

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

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

See Matrix

$$\$ [[8, 6, 10, 3, 0, 0], [10, 8, 3, 6, 0, 0], [3, 10, 6, 8, 0, 0], [6, 3, 8, 10, 0, 0]] \$$$

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

12 . Coloring, {3, 5}

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

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

‘ 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 | 4 vs 4 |

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

See Matrix

$$\$ [[0, 0, 10, 9, 8, 0], [0, 0, 17, 0, 10, 0], [0, 0, 10, 0, 17, 0]] \$$$

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

Omega Rank for B : cycles: $\{\{1, 2, 4, 6\}\}$ order: 4

See Matrix

$$\$ [[12, 6, 0, 3, 0, 6] , [6, 12, 0, 6, 0, 3] , [3, 6, 0, 12, 0, 6] , [6, 3, 0, 6, 0, 12]] \$$$

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

13 . Coloring, $\{3, 6\}$

R: [4, 5, 5, 3, 1, 1]

B: [2, 4, 1, 6, 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 | 4 vs 4 | 5 vs 5 |

Omega Rank for R : cycles: $\{\{1, 3, 4, 5\}\}$ order: 4

See Matrix

$$\$ [[7, 0, 6, 6, 8, 0] , [8, 0, 6, 7, 6, 0] , [6, 0, 7, 8, 6, 0] , [6, 0, 8, 6, 7, 0]] \$$$

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

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

See Matrix

$$\$ [[5, 6, 4, 6, 0, 6] , [4, 5, 0, 12, 0, 6] , [0, 4, 0, 11, 0, 12] , [0, 0, 0, 16, 0, 11] , [0, 0, 0, 11, 0, 16]] \$$$

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

14 . Coloring, $\{4, 5\}$

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

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

‘ 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 | 5 vs 5 |

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

See Matrix

\$ [[5, 0, 4, 9, 3, 6] , [4, 0, 3, 11, 0, 9] , [3, 0, 0, 13, 0, 11] , [0, 0, 0, 14, 0, 13] , [0, 0, 0, 13, 0, 14]] \$

[y₃, 0, y₂, y₁, y₄, y₅]

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

See Matrix

\$ [[7, 6, 6, 3, 5, 0] , [5, 7, 3, 6, 6, 0] , [6, 5, 6, 7, 3, 0] , [3, 6, 7, 5, 6, 0] , [6, 3, 5, 6, 7, 0]] \$

[y₁, y₂, y₃, y₅, y₄, 0]

15 . Coloring, {4, 6}

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

B: [2, 4, 5, 3, 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 | 4 vs 4 | 4 vs 4 |

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

See Matrix

\$ [[12, 0, 0, 6, 3, 6] , [9, 0, 0, 12, 0, 6] , [6, 0, 0, 9, 0, 12] , [12, 0, 0, 6, 0, 9]] \$

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

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

See Matrix

$$\$ [[0, 6, 10, 6, 5, 0], [0, 0, 11, 6, 10, 0], [0, 0, 16, 0, 11, 0], [0, 0, 11, 0, 16, 0]] \$$$

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

16 . Coloring, $\{5, 6\}$

R: [4, 5, 1, 3, 3, 1]

B: [2, 4, 5, 6, 1, 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 | 5 vs 5 |

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

See Matrix

$$\$ [[8, 0, 10, 6, 3, 0], [10, 0, 9, 8, 0, 0], [9, 0, 8, 10, 0, 0], [8, 0, 10, 9, 0, 0]] \$$$

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

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

See Matrix

$$\$ [[4, 6, 0, 6, 5, 6], [5, 4, 0, 12, 0, 6], [0, 5, 0, 10, 0, 12], [0, 0, 0, 17, 0, 10], [0, 0, 0, 10, 0, 17]] \$$$

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

17 . Coloring, $\{2, 3, 4\}$

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

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

‘ 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 : cycles: {{4, 6}} order: 4

See Matrix

$$\$ [[4, 0, 0, 12, 5, 6], [5, 0, 0, 10, 0, 12], [0, 0, 0, 17, 0, 10], [0, 0, 0, 10, 0, 17]] \$$$

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

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

See Matrix

$$\$ [[8, 6, 10, 0, 3, 0], [10, 8, 3, 0, 6, 0], [3, 10, 6, 0, 8, 0], [6, 3, 8, 0, 10, 0]] \$$$

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

18 . Coloring, {2, 3, 5}

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

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

‘ 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 | 4 vs 4 |

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

See Matrix

$$\$ [[0, 0, 10, 12, 5, 0], [0, 0, 17, 0, 10, 0], [0, 0, 10, 0, 17, 0]] \$$$

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

Omega Rank for B : cycles: $\{\{1, 2, 5\}\}$ order: 3

See Matrix

$$\$ [[12, 6, 0, 0, 3, 6], [9, 12, 0, 0, 6, 0], [6, 9, 0, 0, 12, 0], [12, 6, 0, 0, 9, 0]] \$$$

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

19 . Coloring, $\{2, 3, 6\}$

R: $[4, 4, 5, 3, 1, 1]$

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

‘ 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 | 4 vs 4 | 4 vs 6 |

Omega Rank for R : cycles: $\{\{1, 3, 4, 5\}\}$ order: 4

See Matrix

$$\$ [[7, 0, 6, 9, 5, 0], [5, 0, 9, 7, 6, 0], [6, 0, 7, 5, 9, 0], [9, 0, 5, 6, 7, 0]] \$$$

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

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

See Matrix

$$\$ [[5, 6, 4, 3, 3, 6], [4, 5, 3, 6, 6, 3], [3, 4, 6, 3, 5, 6], [6, 3, 5, 6, 4, 3], [5, 6, 4, 3, 3, 6], [4, 5, 3, 6, 6, 3]] \$$$

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

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

20 . Coloring, $\{2, 4, 5\}$

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

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

‘ 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 : cycles: {{4, 6}} order: 4

See Matrix

\$ [[5, 0, 4, 12, 0, 6] , [4, 0, 0, 11, 0, 12] , [0, 0, 0, 16, 0, 11] , [0, 0, 0, 11, 0, 16]] \$

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

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

See Matrix

\$ [[7, 6, 6, 0, 8, 0] , [8, 7, 0, 0, 12, 0] , [12, 8, 0, 0, 7, 0] , [7, 12, 0, 0, 8, 0]] \$

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

21 . Coloring, {2, 4, 6}

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

B: [2, 5, 5, 3, 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 | 3 vs 4 |

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

See Matrix

$$\$ [[12, 0, 0, 9, 0, 6], [6, 0, 0, 12, 0, 9], [9, 0, 0, 6, 0, 12]] \$$$

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

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

See Matrix

$$\$ [[0, 6, 10, 3, 8, 0], [0, 0, 11, 0, 16, 0], [0, 0, 16, 0, 11, 0], [0, 0, 11, 0, 16, 0]] \$$$

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

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

22 . Coloring, {2, 5, 6}

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

B: [2, 5, 5, 6, 1, 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 | 4 vs 5 |

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

See Matrix

$$\$ [[8, 0, 10, 9, 0, 0], [10, 0, 9, 8, 0, 0], [9, 0, 8, 10, 0, 0]] \$$$

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

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

See Matrix

$$\$ [[4, 6, 0, 3, 8, 6], [8, 4, 0, 6, 6, 3], [6, 8, 0, 3, 4, 6], [4, 6, 0, 6, 8, 3], [8, 4, 0, 3, 6, 6]] \$$$

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

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

23 . Coloring, {3, 4, 5}

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

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

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

See Matrix

$$\$ [[0, 0, 4, 9, 8, 6], [0, 0, 8, 6, 4, 9], [0, 0, 4, 9, 8, 6], [0, 0, 8, 6, 4, 9]] \$$$

$$[0, 0, 4y_2, -15y_2 + 16y_1, -16y_2 + 16y_1, 4y_1]$$

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

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

See Matrix

$$\$ [[12, 6, 6, 3, 0, 0], [6, 12, 3, 6, 0, 0], [3, 6, 6, 12, 0, 0], [6, 3, 12, 6, 0, 0]] \$$$

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

24 . Coloring, {3, 4, 6}

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

B: [2, 4, 1, 3, 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 | 4 vs 4 | 4 vs 4 |

Omega Rank for R : cycles: $\{\{1, 4, 6\}\}$ order: 3
See Matrix

$$\$ [[7, 0, 0, 6, 8, 6], [14, 0, 0, 7, 0, 6], [6, 0, 0, 14, 0, 7], [7, 0, 0, 6, 0, 14]] \$$$

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

Omega Rank for B : cycles: $\{\{1, 2, 3, 4\}\}$ order: 4
See Matrix

$$\$ [[5, 6, 10, 6, 0, 0], [10, 5, 6, 6, 0, 0], [6, 10, 6, 5, 0, 0], [6, 6, 5, 10, 0, 0]] \$$$

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

25 . Coloring, $\{3, 5, 6\}$

R: [4, 5, 5, 3, 3, 1]

B: [2, 4, 1, 6, 1, 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 : cycles: $\{\{3, 5\}\}$ order: 4
See Matrix

$$\$ [[3, 0, 10, 6, 8, 0], [0, 0, 14, 3, 10, 0], [0, 0, 13, 0, 14, 0], [0, 0, 14, 0, 13, 0]] \$$$

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

Omega Rank for B : cycles: $\{\{4, 6\}\}$ order: 4
See Matrix

$\$ [[9, 6, 0, 6, 0, 6] , [0, 9, 0, 12, 0, 6] , [0, 0, 0, 15, 0, 12] , [0, 0, 0, 12, 0, 15]] \$$

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

26 . Coloring, {4, 5, 6}

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

B: [2, 4, 5, 3, 1, 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 | 5 vs 5 | 5 vs 5 |

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

See Matrix

$\$ [[8, 0, 4, 6, 3, 6] , [10, 0, 3, 8, 0, 6] , [9, 0, 0, 10, 0, 8] , [8, 0, 0, 9, 0, 10] , [10, 0, 0, 8, 0, 9]] \$$

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

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

See Matrix

$\$ [[4, 6, 6, 6, 5, 0] , [5, 4, 6, 6, 6, 0] , [6, 5, 6, 4, 6, 0] , [6, 6, 4, 5, 6, 0] , [6, 6, 5, 6, 4, 0]] \$$

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

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

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

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

‘ 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 : cycles: $\{\{3, 5\}, \{4, 6\}\}$ order: 2
See Matrix

$$\$ [[0, 0, 4, 12, 5, 6], [0, 0, 5, 6, 4, 12], [0, 0, 4, 12, 5, 6], [0, 0, 5, 6, 4, 12]] \$$$

$$[0, 0, y_1, -2y_1 + 4y_2, y_2, 4y_1 - 2y_2]$$

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

Omega Rank for B : cycles: $\{\{1, 2, 5\}\}$ order: 3
See Matrix

$$\$ [[12, 6, 6, 0, 3, 0], [9, 12, 0, 0, 6, 0], [6, 9, 0, 0, 12, 0], [12, 6, 0, 0, 9, 0]] \$$$

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

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

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

B: [2, 5, 1, 3, 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 | 4 vs 4 | 5 vs 5 |

Omega Rank for R : cycles: $\{\{1, 4, 6\}\}$ order: 3
See Matrix

$$\$ [[7, 0, 0, 9, 5, 6], [11, 0, 0, 7, 0, 9], [9, 0, 0, 11, 0, 7], [7, 0, 0, 9, 0, 11]] \$$$

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

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

See Matrix

$$\$ [[5, 6, 10, 3, 3, 0] , [10, 5, 6, 0, 6, 0] , [6, 10, 6, 0, 5, 0] , [6, 6, 5, 0, 10, 0] , [5, 6, 10, 0, 6, 0]] \$$$

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

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

R: $[4, 4, 5, 3, 3, 1]$

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

‘ 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 5 |

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

See Matrix

$$\$ [[3, 0, 10, 9, 5, 0] , [0, 0, 14, 3, 10, 0] , [0, 0, 13, 0, 14, 0] , [0, 0, 14, 0, 13, 0]] \$$$

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

Omega Rank for B : cycles: $\{\{4, 6\}, \{1, 2, 5\}\}$ order: 6

See Matrix

$$\$ [[9, 6, 0, 3, 3, 6] , [3, 9, 0, 6, 6, 3] , [6, 3, 0, 3, 9, 6] , [9, 6, 0, 6, 3, 3] , [3, 9, 0, 3, 6, 6]] \$$$

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

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

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

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

B: [2, 5, 5, 3, 1, 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 | 5 vs 5 |

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

See Matrix

\$ [[8, 0, 4, 9, 0, 6] , [10, 0, 0, 8, 0, 9] , [9, 0, 0, 10, 0, 8] , [8, 0, 0, 9, 0, 10]] \$

[y₃, 0, y₁, y₂, 0, y₄]

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

See Matrix

\$ [[4, 6, 6, 3, 8, 0] , [8, 4, 3, 0, 12, 0] , [12, 8, 0, 0, 7, 0] , [7, 12, 0, 0, 8, 0] , [8, 7, 0, 0, 12, 0]] \$

[y₂, y₁, y₅, y₄, y₃, 0]

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

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

B: [2, 4, 1, 3, 1, 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 5 | 4 vs 4 |

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

See Matrix

$$\$ [[3, 0, 4, 6, 8, 6], [6, 0, 8, 3, 4, 6], [6, 0, 4, 6, 8, 3], [3, 0, 8, 6, 4, 6], [6, 0, 4, 3, 8, 6]] \$$$

$$[5 y_1 - 4 y_3 + 5 y_4 - 4 y_2, 0, 4 y_1, 4 y_3, 4 y_4, 4 y_2]$$

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

Omega Rank for B : cycles: {{1, 2, 3, 4}} order: 4
See Matrix

$$\$ [[9, 6, 6, 6, 0, 0], [6, 9, 6, 6, 0, 0], [6, 6, 6, 9, 0, 0], [6, 6, 9, 6, 0, 0]] \$$$

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

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

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

B: [2, 5, 1, 3, 1, 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 5 | 3 vs 5 |

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

$$\$ [[3, 0, 4, 9, 5, 6], [6, 0, 5, 3, 4, 9], [9, 0, 4, 6, 5, 3], [3, 0, 5, 9, 4, 6], [6, 0, 4, 3, 5, 9]] \$$$

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

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

Omega Rank for B : cycles: {{1, 2, 5}} order: 3
See Matrix

$$\$ [[9, 6, 6, 3, 3, 0], [9, 9, 3, 0, 6, 0], [9, 9, 0, 0, 9, 0], [9, 9, 0, 0, 9, 0], [9, 9, 0, 0, 9, 0]] \$$$

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

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

| SUMMARY | |
|-------------------|--------------------|
| Graph Type | NOT CC |
| $v(A)$ | 0 |
| $v(\Delta)$ | 1 |
| π | [6, 3, 5, 6, 4, 3] |
| Dbly Stoch | false |

| SANDWICH | | Total 1 |
|----------|----------|---------|
| No . | Coloring | Rank |
| 1 | {} | 3 |

| RT GROUPS | | Total 0 | |
|-----------|----------|---------|------|
| No . | Coloring | Rank | Solv |

| 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 , 31 | 27 , 24 | 1 | 32 | 32 |
