

New Graph

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

$$\pi = [3, 3, 3, 1, 3, 2]$$

POSSIBLE RANKS

1 x 15
3 x 5

BASE DETERMINANT 163959/1048576, .1563634872

NullSpace of Δ

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

Nullspace of A

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

1. Coloring, {}

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

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

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

‘ See graph

‘ ‘ See pair graph

‘

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

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

See Matrix

\$ [[3, 3, 3, 0, 3, 3] , [3, 3, 3, 0, 3, 3] , [3, 3, 3, 0, 3, 3] , [3, 3, 3, 0, 3, 3] , [3, 3, 3, 0, 3, 3]] \$

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

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

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

See Matrix

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

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

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

‘ See 5-level graph

‘

M N

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

$$\$ [[0, 1, 1, 1, 1, 1], [1, 0, 1, 1, 1, 1], [1, 1, 0, 1, 1, 1], [1, 1, 1, 0, 1, 0], [1, 1, 1, 1, 0, 1], [1, 1, 1, 0, 1, 0]] \$$$

$$\tau = 8, r' = 4/5$$

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

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

Ranges

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

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

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

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

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

Partitions

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

$$b_1 = \{2\} \text{ ‘ , ‘ } b_2 = \{1\} \text{ ‘ , ‘ } b_3 = \{3\} \text{ ‘ , ‘ } b_4 = \{4, 6\} \text{ ‘ , ‘ } b_5 = \{5\}$$

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

with invariant measure $[1, 1, 1, 1, 1]$

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

‘ ‘ See level-5 partition graph.

‘

Right Group	
Coloring	{}
Rank	5
R,B	[3, 5, 6, 1, 2, 1], [5, 1, 2, 6, 3, 4]
π_2	[3, 3, 1, 3, 2, 3, 1, 3, 2, 1, 3, 2, 1, 0, 2]
u_2	[1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 1] (dim 1)
wpp	[1, 1, 1, 2, 1, 2]
π_5	[1, 0, 2, 0, 0, 0]
u_5	[1, 0, 1, 0, 0, 0]

2 . Coloring, {2}

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

B: [5, 5, 2, 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 5

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

See Matrix

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

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

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

See Matrix

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

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

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

3 . Coloring, {3}

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

B: [5, 1, 6, 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: $\{\{2, 5\}\}$ order: 4

See Matrix

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

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

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

See Matrix

$$\$ [[3, 0, 3, 2, 3, 4], [0, 0, 3, 4, 3, 5], [0, 0, 3, 5, 0, 7], [0, 0, 0, 7, 0, 8], [0, 0, 0, 8, 0, 7]] \$$$

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

4 . Coloring, {4}

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

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

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

See Matrix

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

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

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

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

See Matrix

\$ [[4, 3, 3, 2, 3, 0] , [5, 3, 3, 0, 4, 0] , [3, 3, 4, 0, 5, 0] , [3, 4, 5, 0, 3, 0] , [4, 5, 3, 0, 3, 0]] \$

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

5 . Coloring, {5}

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

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

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

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

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

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

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

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

6 . Coloring, $\{6\}$

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

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

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

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

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

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

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

\$ [[5, 3, 3, 0, 3, 1] , [4, 3, 3, 0, 5, 0] , [3, 3, 5, 0, 4, 0] , [3, 5, 4, 0, 3, 0] , [5, 4, 3, 0, 3, 0]] \$

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

7 . Coloring, {2, 3}

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

B: [5, 5, 6, 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	4 vs 4

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

See Matrix

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

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

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

See Matrix

\$ [[0, 0, 3, 2, 6, 4] , [0, 0, 6, 4, 0, 5] , [0, 0, 0, 5, 0, 10] , [0, 0, 0, 10, 0, 5]] \$

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

8 . Coloring, {2, 4}

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

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

$$\$ [[5, 3, 3, 0, 0, 4], [7, 0, 5, 0, 0, 3], [3, 0, 7, 0, 0, 5], [5, 0, 3, 0, 0, 7]] \$$$

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

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

$$\$ [[1, 3, 3, 2, 6, 0], [2, 3, 6, 0, 4, 0], [0, 6, 4, 0, 5, 0], [0, 4, 5, 0, 6, 0], [0, 5, 6, 0, 4, 0]] \$$$

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

9 . Coloring, $\{2, 5\}$

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

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

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

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

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

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

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

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

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

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

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

B: [5, 5, 2, 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	5 vs 5	5 vs 5

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

$$\$ [[4, 3, 3, 2, 0, 3], [5, 0, 4, 3, 0, 3], [3, 0, 5, 3, 0, 4], [3, 0, 3, 4, 0, 5], [4, 0, 3, 5, 0, 3]] \$$$

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

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

$$\$ [[2, 3, 3, 0, 6, 1], [1, 3, 6, 0, 5, 0], [0, 6, 5, 0, 4, 0], [0, 5, 4, 0, 6, 0], [0, 4, 6, 0, 5, 0]] \$$$

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

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

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

B: [5, 1, 6, 1, 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	5 vs 5	5 vs 5

Omega Rank for R : cycles: $\{\{2, 5\}\}$ order: 4

See Matrix

$$\$ [[2, 6, 3, 0, 3, 1], [1, 6, 2, 0, 6, 0], [0, 8, 1, 0, 6, 0], [0, 7, 0, 0, 8, 0], [0, 8, 0, 0, 7, 0]] \$$$

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

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

See Matrix

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

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

12 . Coloring, $\{3, 5\}$

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

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

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

See Matrix

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

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

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

See Matrix

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

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

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

13 . Coloring, {3, 6}

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

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

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

See Matrix

$$\$ [[1, 6, 3, 2, 3, 0], [2, 6, 1, 0, 6, 0], [0, 7, 2, 0, 6, 0], [0, 8, 0, 0, 7, 0], [0, 7, 0, 0, 8, 0]] \$$$

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

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

See Matrix

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

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

14 . Coloring, {4, 5}

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

B: [5, 1, 2, 1, 2, 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, 3, 6}} order: 3

See Matrix

\$ [[2, 0, 6, 0, 3, 4], [4, 0, 5, 0, 0, 6], [6, 0, 4, 0, 0, 5], [5, 0, 6, 0, 0, 4]] \$

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

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

See Matrix

\$ [[4, 6, 0, 2, 3, 0], [8, 3, 0, 0, 4, 0], [3, 4, 0, 0, 8, 0], [4, 8, 0, 0, 3, 0]] \$

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

15 . Coloring, {4, 6}

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

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

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

See Matrix

$\$ [[0, 3, 3, 2, 3, 4], [0, 3, 0, 4, 3, 5], [0, 3, 0, 5, 3, 4], [0, 3, 0, 4, 3, 5], [0, 3, 0, 5, 3, 4]] \$$

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

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

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

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

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

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

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

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

‘ 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	4 vs 4

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

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

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

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

$\$ [[5, 6, 0, 0, 3, 1], [7, 3, 0, 0, 5, 0], [3, 5, 0, 0, 7, 0], [5, 7, 0, 0, 3, 0]] \$$

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

17 . Coloring, {2, 3, 4}

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

B: [5, 5, 6, 1, 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, 2, 3}} order: 3

See Matrix

\$ [[5, 6, 3, 0, 0, 1] , [7, 3, 5, 0, 0, 0] , [3, 5, 7, 0, 0, 0] , [5, 7, 3, 0, 0, 0]] \$

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

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

See Matrix

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

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

18 . Coloring, {2, 3, 5}

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

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

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

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

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

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

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

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

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

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

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

B: [5, 5, 6, 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	4 vs 4

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

$$\$ [[4, 6, 3, 2, 0, 0], [8, 3, 4, 0, 0, 0], [3, 4, 8, 0, 0, 0], [4, 8, 3, 0, 0, 0]] \$$$

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

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

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

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

20 . Coloring, {2, 4, 5}

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

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

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

See Matrix

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

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

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

See Matrix

$$\$ [[1, 6, 0, 2, 6, 0], [2, 6, 0, 0, 7, 0], [0, 7, 0, 0, 8, 0], [0, 8, 0, 0, 7, 0]] \$$$

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

21 . Coloring, {2, 4, 6}

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

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

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

$$\$ [[3, 3, 3, 2, 0, 4], [3, 0, 3, 4, 0, 5], [0, 0, 3, 5, 0, 7], [0, 0, 0, 7, 0, 8], [0, 0, 0, 8, 0, 7]] \$$$

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

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

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

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

22 . Coloring, {2, 5, 6}

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

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

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

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

Omega Rank for B : cycles: {{2, 5}} order: 4
See Matrix

$$\$ [[2, 6, 0, 0, 6, 1], [1, 6, 0, 0, 8, 0], [0, 8, 0, 0, 7, 0], [0, 7, 0, 0, 8, 0]] \$$$

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

23 . Coloring, {3, 4, 5}

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

B: [5, 1, 6, 1, 2, 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: {{2, 3, 5}} order: 3

See Matrix

$\$ [[2, 3, 6, 0, 3, 1], [1, 6, 5, 0, 3, 0], [0, 5, 4, 0, 6, 0], [0, 4, 6, 0, 5, 0], [0, 6, 5, 0, 4, 0]] \$$

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

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

See Matrix

$\$ [[4, 3, 0, 2, 3, 3], [5, 3, 0, 3, 4, 0], [6, 4, 0, 0, 5, 0], [4, 5, 0, 0, 6, 0], [5, 6, 0, 0, 4, 0]] \$$

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

24 . Coloring, {3, 4, 6}

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\$ [[1, 3, 6, 2, 3, 0], [2, 6, 4, 0, 3, 0], [0, 4, 5, 0, 6, 0], [0, 5, 6, 0, 4, 0], [0, 6, 4, 0, 5, 0]] \$$$

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

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

$$\$ [[5, 3, 0, 0, 3, 4], [7, 3, 0, 0, 5, 0], [3, 5, 0, 0, 7, 0], [5, 7, 0, 0, 3, 0]] \$$$

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

26 . Coloring, {4, 5, 6}

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

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

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

See Matrix

$$\$ [[0, 0, 6, 2, 3, 4], [0, 0, 3, 4, 0, 8], [0, 0, 0, 8, 0, 7], [0, 0, 0, 7, 0, 8]] \$$$

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

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

See Matrix

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

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

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

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

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

$$\$ [[5, 3, 6, 0, 0, 1], [4, 6, 5, 0, 0, 0], [6, 5, 4, 0, 0, 0], [5, 4, 6, 0, 0, 0]] \$$$

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

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

$$\$ [[1, 3, 0, 2, 6, 3], [2, 6, 0, 3, 4, 0], [3, 4, 0, 0, 8, 0], [0, 8, 0, 0, 7, 0], [0, 7, 0, 0, 8, 0]] \$$$

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

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

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

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

Omega Rank for R : cycles: $\{\{4, 6\}, \{1, 2, 3\}\}$ order: 6
 See Matrix

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

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

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

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

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

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

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

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

B: [5, 5, 6, 6, 2, 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: {{1, 2, 3}} order: 3

See Matrix

$$\$ [[4, 3, 6, 2, 0, 0], [5, 6, 4, 0, 0, 0], [6, 4, 5, 0, 0, 0], [4, 5, 6, 0, 0, 0]] \$$$

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

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

See Matrix

$$\$ [[2, 3, 0, 0, 6, 4], [4, 6, 0, 0, 5, 0], [0, 5, 0, 0, 10, 0], [0, 10, 0, 0, 5, 0]] \$$$

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

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

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

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

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

$$\$ [[3, 0, 6, 2, 0, 4], [0, 0, 3, 4, 0, 8], [0, 0, 0, 8, 0, 7], [0, 0, 0, 7, 0, 8]] \$$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Omega Rank for R : cycles: {{4, 6}, {1, 2, 3}} order: 6

See Matrix

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

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

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

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

See Matrix

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

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

SUMMARY	
Graph Type	NOT CC
$v(\mathbf{A})$	0
$v(\Delta)$	1
π	[3, 3, 3, 1, 3, 2]
Dbly Stoch	false

SANDWICH		Total 0
No .	Coloring	Rank

RT GROUPS		Total 1	
No .	Coloring	Rank	Solv
1	{}	5	Not 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	24 , 26	1	32	32
