

New Graph

[4, 3, 1, 2], [3, 4, 4, 3]

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

POSSIBLE RANKS

1 x 6
2 x 3

BASE DETERMINANT 3/16, .1875000000

NullSpace of Δ

{1, 2, 3, 4}

Nullspace of A

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

1 . Coloring, {}

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

R: [4, 3, 1, 2]

B: [3, 4, 4, 3]

[See graph](#)

[See pair graph](#)

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

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

[See Matrix](#)

$[y_1, y_1, y_2, y_2]$

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

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

[See Matrix](#)

$[0, 0, y_1, y_1]$

$$p = s - s^2$$

	M	N
	0 1 0 0	0 3 2 1
	1 0 0 0	3 0 1 2
	[0 0 0 2]	[2 1 0 3]
	0 0 2 0	1 2 3 0

$$\tau = 8, r' = 1/2$$

R: [4, 3, 1, 2]

B: [3, 4, 4, 3]

Ranges

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

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

Cycles: R, {{1, 2, 3, 4}}, B, {{3, 4}}

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

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

Partitions

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

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

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

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

$$b1 = \{1, 3\}, b2 = \{1, 4\}, b3 = \{2, 3\}, b4 = \{2, 4\}$$

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

N by blocks, check: true . [See partition graph.](#)

[See level-2 partition graph.](#)

Sandwich	
Coloring	{}
Rank	2
R,B	[4, 3, 1, 2], [3, 4, 4, 3]
Π_2	[1, 0, 0, 0, 0, 2]
u_2	[3, 2, 1, 1, 2, 3] (dim 1)
wpp	[2, 2, 2, 2]

2 . Coloring, {2}

R: [4, 4, 1, 2]

B: [3, 3, 4, 3]

[See graph](#)[See pair graph](#)

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

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

[See Matrix](#) $[y_1, y_2, 0, y_3]$

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

[See Matrix](#) $[0, 0, y_2, y_1]$

3 . Coloring, {3}

R: [4, 3, 4, 2]

B: [3, 4, 1, 3]

[See graph](#)[See pair graph](#)

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

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

[See Matrix](#) $[0, y_3, y_1, y_2]$

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

[See Matrix](#)

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

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

4 . Coloring, {4}

R: [4, 3, 1, 3]

B: [3, 4, 4, 2]

[See graph](#)

[See pair graph](#)

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

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

[See Matrix](#)

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

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

[See Matrix](#)

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

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

5 . Coloring, {2, 3}

R: [4, 4, 4, 2]

B: [3, 3, 1, 3]

[See graph](#)

[See pair graph](#)

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

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

[See Matrix](#)

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

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

[See Matrix](#)

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

6 . Coloring, {2, 4}

$$\Omega p(\Delta)=0: \quad p = s^2 \quad p' = s^2$$

R: [4, 4, 1, 3]

B: [3, 3, 4, 2]

[See graph](#)

[See pair graph](#)

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

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

[See Matrix](#)

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

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

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

[See Matrix](#)

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

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

[See 3-level graph](#)

M	N
0 0 1 1	0 0 1 1
0 0 1 1	0 0 1 1
[1 1 0 2]	[1 1 0 1]
1 1 2 0	1 1 1 0

$$\tau = 6, r' = 2/3$$

R: [4, 4, 1, 3]

B: [3, 3, 4, 2]

Ranges

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

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

Cycles: R, {{1, 3, 4}}, B, {{2, 3, 4}}

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

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

Partitions

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

b1 = {1, 2}, b2 = {3}, b3 = {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, 4}
Rank	3
R,B	[4, 4, 1, 3], [3, 3, 4, 2]
Π_2	[0, 1, 1, 1, 1, 2]
u_2	[0, 1, 1, 1, 1, 1] (dim 1)
wpp	[2, 2, 1, 1]
Π_3	[0, 0, 1, 1]
u_3	[0, 0, 1, 1]

7 . Coloring, {3, 4}

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

R: [4, 3, 4, 3]

B: [3, 4, 1, 2]

[See graph](#)

[See pair graph](#)

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

Omega Rank for R : cycles: $\{\{3, 4\}\}$ order: 2

[See Matrix](#)

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

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

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

[See Matrix](#)

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

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

	M	N
	0 1 0 0	0 1 0 1
	1 0 0 0	1 0 1 0
	[0 0 0 2]	[0 1 0 1]
	0 0 2 0	1 0 1 0

$$\tau = 8, r' = 1/2$$

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

Ranges

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

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

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

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

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

Partitions

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

$$b1 = \{1, 3\}, \quad b2 = \{2, 4\}$$

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	{3, 4}
Rank	2
R,B	[4, 3, 4, 3], [3, 4, 1, 2]
Π_2	[1, 0, 0, 0, 0, 2]
u_2	[1, 0, 1, 1, 0, 1] (dim 1)
wpp	[2, 2, 2, 2]

8 . Coloring, {2, 3, 4}

R: [4, 4, 4, 3]

B: [3, 3, 1, 2]

[See graph](#)

[See pair graph](#)

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

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

[See Matrix](#)

$[0, 0, y_1, y_2]$

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

[See Matrix](#)

$[y_3, y_2, y_1, 0]$

SUMMARY	
Graph Type	CC
$\nu(A)$	1

$\nu(\Delta)$	1
π	[1, 1, 2, 2]
Dbly Stoch	false

SANDWICH		Total 1
No .	Coloring	Rank
1	{}	2

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

Δ -RANK'D	SC'D !RK'D	τ -RANK'D	R/B RANK'D	NOT SYNC'D	Total Runs	2^{n-1}
5	0	5, 3	5, 3	3	8	8
