New Graph

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

π = [3, 4, 5, 6]
δ= [1, 2, 2, 3]

POSSIBLE RANKS

1 x 18
2 x 9
3 x 6

BASE DETERMINANT 5/32, .1562500000

NullSpace of Δ

{1, 2, 3, 4}

Nullspace of A

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

1 . Coloring, {}

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

` See graph

` ` See pair graph

`

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

Omega Rank for R :
$-t + t^3$
,
cycles: {{3, 4}} order: 2

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

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

Omega Rank for B :
$-t^2 + t^4$
,
cycles: {{2, 3}} order: 2

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

$[y_1, y_2, y_3, 0]$

2 . Coloring, {2}

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

` See graph

` ` See pair graph

`

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

Omega Rank for R :
$-t + t^3$
,
cycles: {{3, 4}} order: 2

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

$[0, 0, y_2, y_1]$

Omega Rank for B :
$-t + t^4$
,
cycles: {{1, 2, 4}} order: 3

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

$[y_1, y_2, 0, y_3]$

3 . Coloring, {3}

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

` See graph

` ` See pair graph

`

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

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

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

$$\begin{pmatrix} 0 & 5 & 6 & 7 \\ 0 & 6 & 7 & 5 \\ 0 & 7 & 5 & 6 \end{pmatrix}$$

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

Omega Rank for B :
$-1 + t^4$

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

$$\begin{pmatrix} 6 & 3 & 4 & 5 \\ 5 & 6 & 3 & 4 \\ 4 & 5 & 6 & 3 \\ 3 & 4 & 5 & 6 \end{pmatrix}$$

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

4 . Coloring, {4}

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

` See graph

` ` See pair graph

`

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

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

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

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

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

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

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

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

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

5 . Coloring, {2, 3}

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

` See graph

` ` See pair graph

`

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

Omega Rank for R :
$-t^2 + t^4$
,
cycles: {{2, 3}}   order: 2

$$\begin{pmatrix} 0 & 5 & 10 & 3 \\ 0 & 10 & 8 & 0 \\ 0 & 8 & 10 & 0 \end{pmatrix}$$

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

Omega Rank for B :
$-t + t^4$
,
cycles: {{1, 2, 4}}   order: 3

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

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

6 . Coloring, {2, 4}

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

` See graph

` ` See pair graph

`

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

Omega Rank for R :
$-t^2 + t^4$
,
cycles: {{1, 4}}   order: 2

6	0	4	8
8	0	0	10
10	0	0	8

$[y_1, 0, y_2, y_3]$

Omega Rank for B :
$-t^{+} t^4$
,
cycles: {{2, 3, 4}} order: 3

0	8	6	4
0	6	4	8
0	4	8	6

$[0, y_3, y_1, y_2]$

7 . Coloring, {3, 4}

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

` See graph

`` See pair graph

`

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

Omega Rank for R :
$-t^{2^{+}} t^4$
,
cycles: {{1, 4}} order: 2

6	5	0	7
7	0	0	11
11	0	0	7

$[y_1, y_2, 0, y_3]$

Omega Rank for B :
$-t^{2^{+}} t^4$
,
cycles: {{3, 4}} order: 2

0	3	10	5
0	0	8	10
0	0	10	8

$[0, y_1, y_2, y_3]$

8 . Coloring, {2, 3, 4}

Ωp(Δ)=0: $p = s + 4s^2 + 4s^3$

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

` See graph

` ` See pair graph

`

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

Omega Rank for R :
$-1 + t^2$
,
cycles: {{2, 3}, {1, 4}} order: 2

$$\begin{pmatrix} 6 & 5 & 4 & 3 \\ 3 & 4 & 5 & 6 \\ 6 & 5 & 4 & 3 \\ 3 & 4 & 5 & 6 \end{pmatrix}$$

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

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

Omega Rank for B :
$-t^2 + t^4$
,
cycles: {{3, 4}} order: 2

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

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

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

M N

$$\begin{pmatrix} 0 & 2 & 1 & 0 \\ 2 & 0 & 0 & 2 \\ 1 & 0 & 0 & 4 \\ 0 & 2 & 4 & 0 \end{pmatrix} \quad \begin{pmatrix} 0 & 1 & 1 & 0 \\ 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{pmatrix}$$

NM

$$\begin{pmatrix} 3 & 0 & 0 & 6 \\ 0 & 4 & 5 & 0 \\ 0 & 4 & 5 & 0 \\ 3 & 0 & 0 & 6 \end{pmatrix}$$

τ= 8 , r'= 1/2

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

Ranges

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

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

β({1, 2}) = 2/9
β({1, 3}) = 1/9
β({2, 4}) = 2/9
β({3, 4}) = 4/9

Partitions
α([{2, 3}, {1, 4}]) = 1/1

b1 = {2, 3} ` , ` b2 = {1, 4}

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

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

` ` See level-2 partition graph.

`

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

SUMMARY	
Graph Type	CC
ν(A)	1
ν(Δ)	1
π	[3, 4, 5, 6]
Dbly Stoch	false

SANDWICH		Total 0

No .	Coloring	Rank

RT GROUPS		Total 1	
No .	Coloring	Rank	Solv
1	{2, 3, 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}
7	0	6 , 7	7 , 7	1	8	8
