

COMPLEMENTARY EXAMPLE: Constructive System of Structures with five vertices

GS(5.10)
120: 1,000; 84
GS(5.9)

GS(5.8.1)	GS(5.8.2)
8; 0.542; 28	4; 0.361; 56
(3) (4)	(1) (2) (3) (4)

GS(5.7.1)	GS(5.7.2)	GS(5.7.3)	GS(5.7.4)
12; 0.610; 7	6; 0.429; 14	4; 0.361; 21	2; 0.241; 42
(2) (6)	(1) (5) (6)	(2) (4) (5)	(3) (4) (5) (6)

GS(5.6.1)	GS(5.6.2)	GS(5.6.3)	GS(5.6.4)	GS(5.6.5)	GS(5.6.6)
24; 0.708; 2	12; 0.610; 4	8; 0.542; 6	2; 0.241; 24	2; 0.181; 24	2; 0.181; 24
(2)	(5)	(3) (6)	(1) (4) (5) (6)	(2) (4) (5) (6)	(2) (3) (4) (5)

GS(5.5.1)	GS(5.5.2)	GS(5.5.3)	GS(5.5.4)	GS(5.5.5)	GS(5.6.6)
10; 0.699; 2	4; 0.639; 10	4; 0.639; 10	2; 0.241; 20	2; 0.181; 20	2; 0.181; 20
(4)	(3) (6)	(1) (5) (6)	(4) (5) (6)	(3) (4) (5)	(2) (4) (5) (6)

GS(5.4.1)	GS(5.4.2)	GS(5.4.3)	GS(5.4.4)	GS(5.4.5)	GS(5.4.6)
24; 0.708; 2	12; 0.610; 4	8; 0.542; 6	2; 0.241; 24	2; 0.181; 24	2; 0.181; 24
(2)	(1) (3)	(4)	(3) (4)	(2) (3) (4)	(1) (2) (4)

GS(5.3.1)	GS(5.3.2)	GS(5.3.3)	GS(5.3.4)
12; 0.610; 7	6; 0.429; 14	4; 0.361; 21	2; 0.241; 42
(2)	(2)	(1) (2)	(1) (2)

GS(5.2.1)	GS(5.2.2)
8; 0.542; 28	4; 0.361; 56
GS(5.1)	GS(5.1)

GS(5.1)
12; 0.610; 84
GS(5.0)

GS(5.0)
120; 1,000; 84

Explanations

GS(5.1)
12; 0.610; 84
GS(5.0)

First row: Mark of graph-structure.  
 Middle row: 1) Number of automorphisms; 2) Symmetry value **SR**; 3) Probability **84PS**.  
 Neither row: Marking of adjacent substructures.

\*

Specific explanations:

- K** – Number of vertex orbits;
- N** – Number of pair orbits;
- N<sup>+</sup>** – Number of “non-edge” orbits;
- N<sup>-</sup>** – Number of “non-edge” orbits;
- SVV** – Sign of vertex symmetry;
- SV** – Value of vertex symmetry;
- SRV** – Sign of pair symmetry;
- HR** – Information capacity of pair symmetry;
- SR** – Value of pair symmetry;
- SEV** – Sign of edge symmetry;
- SEV** – Value of edge symmetry;
- aut** – Number of automorphisms;
- 84PS** – State probability with 84-times;
- n<sup>+</sup>** – Number of pair(+)orbits;
- n<sup>-</sup>** – Number of pair(-)orbits;
- MC** – Maximum clique;
- MG** – Maximum girth;
- d<sub>mn</sub>** – Diameter;
- b** – Bipartite graph;
- e** – Euler’s graph;
- f** – Forest;
- h** – Hamilton’s graph;
- p** – Planar graph;
- u** – Uniqually colorable;
- TRA** – Measure of triangularity;
- BRA** – Measure of branching;
- adj** – Adjacent structure;
- uppn** – Adjacent superstructure;
- low<sub>n</sub>** – Adjacent substructure;
- k, k<sup>2</sup>** – Coordinates of partial matrix;
- PF<sub>n</sub>** – Translation or morphism probability.

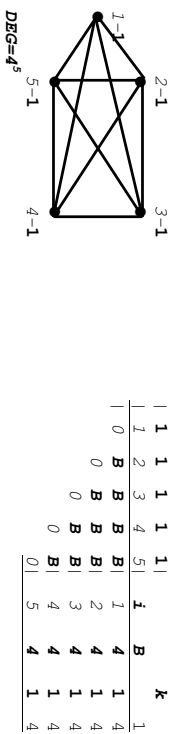
**Graph GS(5,10) and its complement GS(5,0)** (by Graph Atlas G52 and G19)

Common invariants and measures of the structure and its complement:

Symmetry	K	N	SVV	SV	SRV	HR	SR	aut	84FS
Complete	1	1	5 <sup>1</sup>	1.000	10 <sup>1</sup>	0	1.000	120	84

GS(5,10), its pair signs and sign matrix **S** with *u*- and *s*-signs:

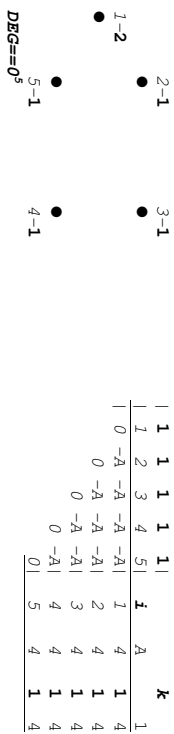
**B: +2.5.10.**



	1	1	1	1	1	k
1	1	1	1	1	1	1
2	1	2	3	4	5	1
B	0	B	B	B	B	1
B	0	B	B	B	2	1
B	0	B	B	B	3	1
B	0	B	B	B	4	1
B	0	B	B	B	5	1

GS(5,0) (complement of GS(5,10), its pair signs and sign matrix **S** with *u*- and *s*-signs:

**A: -0.2.0.**



	1	1	1	1	1	k
1	1	1	1	1	1	1
2	1	2	3	4	5	1
0	0	-A	-A	-A	-A	1
0	0	-A	-A	-A	2	1
0	0	-A	-A	-A	3	1
0	0	-A	-A	-A	4	1
0	0	-A	-A	-A	5	1

Distinguishing invariants and measures:

GS	E	N'	N''	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5,10)	10	1	0	10 <sup>1</sup>	1.000	5	3	1	ehu	1.000	0
GS(5,0)	0	0	1	10 <sup>1</sup>	1.000	1	0	0	bfpv	0	1.000

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	adj <sub>n</sub>	1
GS(5,10)	up <sub>p<sub>n</sub></sub>	-
	k.k'	-
	PF <sub>n</sub>	GS(5,9)
	low <sub>n</sub>	1.1
	k.k'	10/10
	up <sub>p<sub>n</sub></sub>	GS(5,1)
	k.k'	1.1
GS(5,0)	PF <sub>n</sub>	10/10
	low <sub>n</sub>	-
	k.k'	-
	PF <sub>n</sub>	-

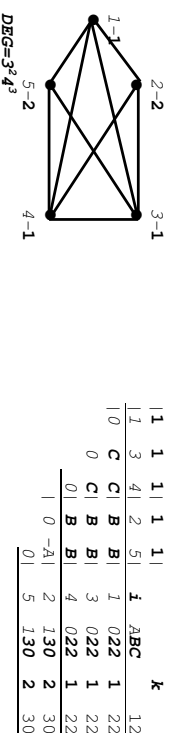
**Graph GS(5,9) and its complement GS(5,1)** (by Graph Atlas G51 and G20)

Common invariants and measures of the structure and its complement:

Symmetry	K	N	SVV	SV	SRV	HR	SR	aut	84FS
Partial	2	3	2 <sup>3</sup>	0.5818	1 <sup>3</sup> 6 <sup>1</sup>	0.3899	0.6100	12	84

GS(5,9), its pair signs and sign matrix **S** with *u*- and *s*-signs:

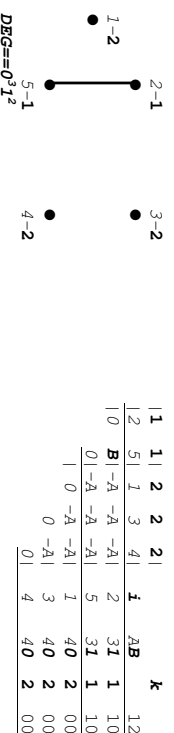
**A: -2.5.9; B: +2.4.6; C: +2.5.9.**



	1	1	1	1	1	k
1	1	3	4	2	5	1
0	0	C	B	B	B	1
0	0	C	B	B	3	1
0	0	B	B	4	022	1
0	0	-A	2	130	2	30
0	0	-A	2	130	2	30

GS(5,1) (complement of GS(5,9), its pair signs and sign matrix **S** with *u*- and *s*-signs:

**A: -0.2.0; B: +1.2.1.**



	1	1	2	2	2	k
1	1	2	3	4	1	AB
2	5	1	3	4	1	AB
0	0	B	-A	-A	-A	2
0	0	-A	-A	-A	5	31
0	0	-A	-A	-A	1	10
0	0	-A	-A	-A	1	40
0	0	-A	-A	-A	1	40
0	0	-A	-A	-A	3	40
0	0	-A	-A	-A	4	40
0	0	-A	-A	-A	2	00

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	E	N'	N''	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5,9)	9	2	1	3 <sup>1</sup> 6 <sup>1</sup>	0.7103	4	3	2	hpu	1.000	0
GS(5,1)	1	1	2	1 <sup>1</sup>	1.000	2	0	1	bfp	0	1.000

GS	adj <sub>n</sub>	1	2
GS(5,9)	up <sub>p<sub>n</sub></sub>	GS(5,10)	-
	k.k'	2.2	-
	PF <sub>n</sub>	1/1	-
	low <sub>n</sub>	GS(5,8.1)	GS(5,8.2)
	k.k'	1.1	1.2
	PF <sub>n</sub>	3/9	6/9
	up <sub>p<sub>n</sub></sub>	GS(5.2.1)	GS(5.2.2)
	k.k'	2.2	1.2
	PF <sub>n</sub>	3/9	6/9
GS(5,1)	low <sub>n</sub>	GS(5,0)	-
	k.k'	1.1	-
	PF <sub>n</sub>	1/1	-



**Graph GS(5.7.1) and its complement GS(5.3.1)** (by Graph Atlas G46 and G23)

Common invariants and measures of the structure and its complement:

Symmetry	K	N	SVV	SV	SRV	HR	SR	aut	84PS
Partial	2	3	$2^13^1$	$0.5818$	$1^31^6$	$0.38997$	$0.61003$	12	7

GS(5.7.1), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-2, 4, 5$ ; B:  $+2, 3, 3$ ; C:  $+2, 5, 7$ .



GS(5.3.1) (complement of GS(5.7.1)), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-0, 2, 0$ ; B:  $+2, 3, 3$ .



Distinguishing invariants and measures:

GS	E	N'	N'	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5.7.1)	7	2	1	$1^61^1$	$0.7892$	3	3	2	epu	$1.000$	0
GS(5.3.1)	3	1	2	$3^1$	$1.000$	3	3	1	p	$1.000$	0

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	$adj_n$	1	2
GS(5.7.1)	$adj_n$	GS(5.8.2)	
	$k, k'$	2.2	-
	$PF_n$	3/3	
	$Low_n$	GS(5.6.2)	GS(5.6.6)
	$k, k'$	1.1	1.2
	$PF_n$	1/7	6/7
	$upp_n$	GS(5.4.2)	GS(5.4.6)
	$k, k'$	2.2	1.2
	$PF_n$	1/7	6/7
	$Low_n$	GS(5.2.2)	
	$k, k'$	1.1	-
	$PF_n$	3/3	

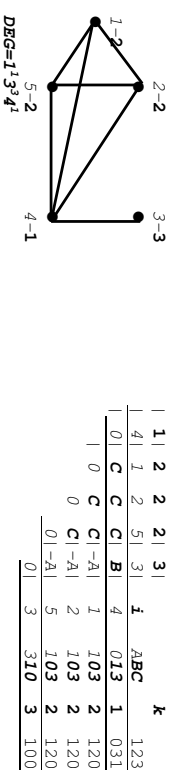
**Graph GS(5.7.2) and its complement GS(5.3.2)** (by Graph Atlas G45 and G24)

Common invariants and measures of the structure and its complement:

Symmetry	K	N	SVV	SV	SRV	HR	SR	aut	84PS
Partial	3	4	$1^33^1$	$0.4096$	$1^33^3$	$0.57059$	$0.42941$	6	14

GS(5.7.2), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-2, 3, 2$ ; B:  $+1, 2, 1$ ; C:  $+2, 4, 6$ .



GS(5.3.2) (complement of GS(5.7.2)), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-2, 3, 2$ ; B:  $-0, 2, 0$ ; C:  $+1, 2, 1$ .



Distinguishing invariants and measures:

GS	E	N'	N'	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5.7.2)	7	3	1	$1^33^2$	$0.4839$	4	3	2	p	$1.000$	0
GS(5.3.2)	3	1	3	$3^1$	$1.000$	2	0	1	bfp	$1.000$	0

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	$adj_n$	1	2	3
GS(5.7.2)	$adj_n$	GS(5.8.2)		
	$k, k'$	2.3	-	-
	$PF_n$	3/3		
	$Low_n$	GS(5.6.1)	GS(5.6.5)	GS(5.6.6)
	$k, k'$	1.3	1.2	2.2
	$PF_n$	1/7	3/7	3/7
	$upp_n$	GS(6.4.1)	GS(6.4.5)	GS(5.4.6)
	$k, k'$	1.2	2.3	3.3
	$PF_n$	1/7	3/7	3/7
	$Low_n$	GS(5.2.2)		
	$k, k'$	1.3	-	-
	$PF_n$	3/3		

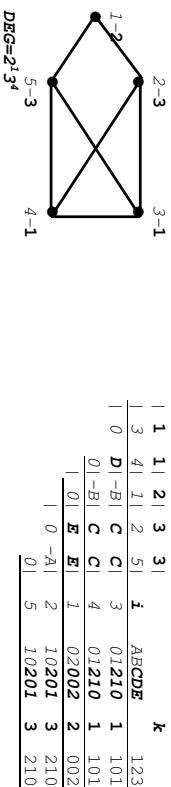
**Graph GS(5.7.3) and its complement GS(5.3.3)** (by Graph Atlas G48 and G26)

Common invariants and measures of the structure and its complement:

Symmetry	K	N	SVV	SV	SRV	HR	SR	aut	84PS
Partial	3	5	$1^2 2^2$	$0.3445$	$1^2 2^2 4^1$	$0.63876$	$0.36121$	4	21

GS(5.7.3), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-2.5.7$ ; B:  $-2.4.4$ ; C:  $+2.3.3$ ; D:  $+2.4.5$ ; E:  $+3.5.7$ .



1	2	3	4	5	6	k
1	3	4	1	2	5	1
1	0	D	-B	C	C	3
0	-B	C	C	4	0	0
0	0	E	E	1	2	0
0	0	-A	2	1	0	2
0	1	0	5	1	0	2

GS(5.3.3) (complement of GS(5.7.3)), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-2.3.2$ ; B:  $-0.2.0$ ; C:  $+1.2.1$ .



1	2	3	4	5	6	k
1	1	2	5	1	3	1
1	0	-B	-B	C	C	1
0	0	C	-B	-B	2	0
0	0	-B	-B	5	0	3
0	0	-A	3	1	2	1
0	1	0	4	1	2	1

Distinguishing invariants and measures:

GS	E	N'	N	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5.7.3)	7	3	2	$1^2 1^4 4^1$	$0.5088$	3	3	2	hp	$1.000$	0
GS(5.3.3)	3	2	3	$1^2 2^1$	$0.4206$	2	0	2	bfp	0	$1.000$

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	adj <sub>n</sub>	1	2	3
GS(5.7.3)	upp <sub>n</sub>	GS(5.8.1)	GS(5.8.2)	-
	k.k'	1.2	3.3	-
	PF <sub>n</sub>	2/3	1/3	-
GS(5.3.3)	Low <sub>n</sub>	GS(5.6.2)	GS(5.6.4)	GS(5.6.5)
	k.k'	1.1	1.3	2.3
	PF <sub>n</sub>	1/7	4/7	2/7
GS(5.3.3)	upp <sub>n</sub>	GS(5.4.2)	GS(5.4.4)	GS(5.4.3)
	k.k'	3.3	2.3	1.2
	PF <sub>n</sub>	1/7	4/7	2/7
GS(5.2.1)	Low <sub>n</sub>	GS(5.2.1)	GS(5.2.2)	-
	k.k'	1.3	2.2	-
	PF <sub>n</sub>	2/3	1/3	-

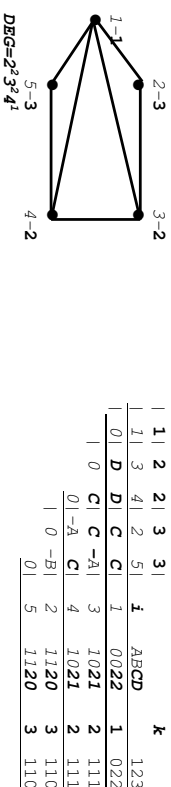
**Graph GS(5.7.4) and its complement GS(5.3.4)** (by Graph Atlas G47 and G25)

Common invariants and measures of the structure and its complement:

Symmetry	K	N	SVV	SV	SRV	HR	SR	aut	84PS
Partial	3	6	$1^2 2^2$	$0.3445$	$1^2 2^4$	$0.75917$	$0.24082$	2	42

GS(5.7.4), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

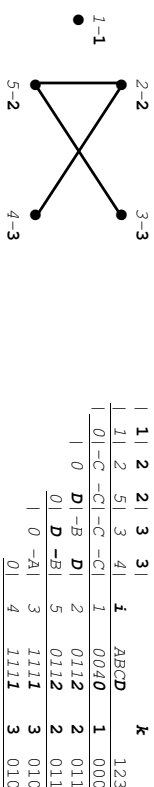
A:  $-2.4.5$ ; B:  $-2.3.2$ ; C:  $+2.3.3$ ; D:  $+2.4.5$ .



1	2	3	4	5	6	k
1	1	3	4	2	5	1
1	0	D	C	C	1	0
0	0	C	-A	3	1	0
0	0	-A	C	4	1	0
0	0	-B	2	1	1	2
0	1	0	5	1	1	2

GS(5.3.4) (complement of GS(5.7.4)), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-3.4.3$ ; B:  $-2.3.2$ ; C:  $-0.2.0$ ; D:  $+1.2.1$ .



1	2	3	4	5	6	k
1	1	2	5	1	3	1
1	0	-C	-C	-C	1	0
0	0	D	-B	D	2	0
0	0	D	-B	5	0	1
0	0	-A	3	1	1	1
0	1	0	4	1	1	1

Distinguishing invariants and measures:

GS	E	N'	N	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5.7.4)	7	4	2	$1^2 3^3$	$0.3053$	3	3	2	hpu	$1.000$	0
GS(5.3.4)	3	2	4	$1^2 2^1$	$0.4206$	2	0	3	bfp	0	$1.000$

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	adj <sub>n</sub>	1	2	3	4
GS(5.7.4)	upp <sub>n</sub>	GS(5.8.1)	GS(5.8.2)	-	-
	k.k'	3.3	2.3	-	-
	PF <sub>n</sub>	1/3	2/3	-	-
GS(5.3.4)	Low <sub>n</sub>	GS(5.6.3)	GS(5.6.4)	GS(5.6.5)	GS(5.6.6)
	k.k'	2.2	1.2	1.3	2.3
	PF <sub>n</sub>	1/7	2/7	2/7	2/7
GS(5.3.4)	upp <sub>n</sub>	GS(5.4.3)	GS(5.4.4)	GS(5.4.5)	GS(5.4.6)
	k.k'	3.3	1.3	1.2	2.3
	PF <sub>n</sub>	1/7	2/7	2/7	2/7
GS(5.2.1)	Low <sub>n</sub>	GS(5.2.1)	GS(5.2.2)	-	-
	k.k'	2.2	2.3	-	-
	PF <sub>n</sub>	1/3	2/3	-	-

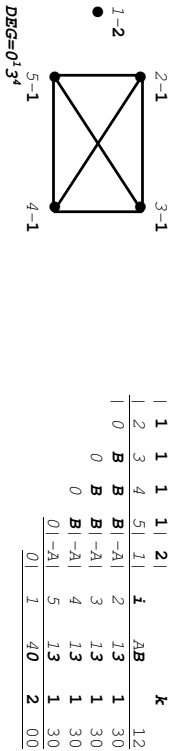
**Graph GS(5.6.1) and its complement GS(5.4.1)** (by Graph Atlas G39 and G29)

Common invariants and measures of the structure and its complement:

Symmetry	K	N	SVV	SV	SRV	HR	SR	aut	84PS
Partial	2	2	$1^4 1$	$0.6891$	$4^1 6^1$	$0.29228$	$0.70771$	24	2

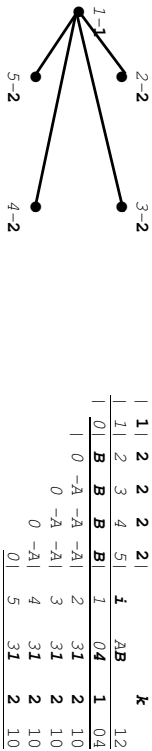
GS(5.6.1), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-0.2.0$ ; B:  $+2.4.6$ .



GS(5.4.1) (complement of GS(5.6.1), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-2.3.2$ ; B:  $+1.2.1$ .



Distinguishing invariants and measures:

GS	/E/	N'	N'	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5.6.1)	6	1	1	$6^1$	$1.000$	4	3	1	$P$	$1.000$	0
GS(5.4.1)	4	1	1	$4^1$	$1.000$	2	0	2	$bptu$	0	$1.000$

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	$adj_n$	$1$
	$upP_n$	GS(5.7.2)
	$k.k'$	1.2
GS(5.6.1)	$PF_n$	4/4
	$low_n$	GS(5.5.2)
	$k.k'$	1.1
	$PF_n$	6/6
	$upP_n$	GS(5.5.3)
	$k.k'$	2.2
GS(5.4.1)	$PF_n$	6/6
	$low_n$	GS(5.3.2)
	$k.k'$	1.2
	$PF_n$	4/4

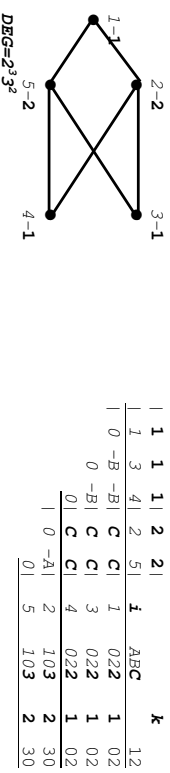
**Graph GS(5.6.2) and its complement GS(5.4.2)** (by Graph Atlas G44 and G32)

Common invariants and measures of the structure and its complement:

Symmetry	K	N	SVV	SV	SRV	HR	SR	aut	84PS
Partial	2	3	$2^1 3^1$	$0.5818$	$1^3 3^1 6^1$	$0.38997$	$0.61003$	12	4

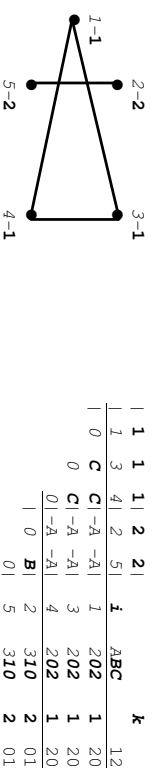
GS(5.6.2), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-2.5.6$ ; B:  $-2.4.4$ ; C:  $+3.5.6$ .



GS(5.4.2) (complement of GS(5.6.2), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-0.2.0$ ; B:  $+1.2.1$ ; C:  $+2.3.3$ .



Distinguishing invariants and measures:

GS	/E/	N'	N'	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5.6.2)	6	1	2	$6^1$	$1.000$	2	4	2	$hp$	0	0
GS(5.4.2)	4	2	1	$1^1 2^1$	$0.5944$	3	3	1	$P$	$0.750$	$0.250$

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	$adj_n$	$1$	$2$
	$upP_n$	GS(5.7.1)	GS(5.7.3)
	$k.k'$	2.2	1.1
GS(5.6.2)	$PF_n$	1/4	3/4
	$low_n$	GS(5.5.5)	-
	$k.k'$	1.2	-
	$PF_n$	6/6	-
	$upP_n$	GS(5.5.6)	-
	$k.k'$	1.2	-
GS(5.4.2)	$PF_n$	6/6	-
	$low_n$	GS(5.3.1)	GS(5.3.3)
	$k.k'$	2.2	1.1
	$PF_n$	1/4	3/4

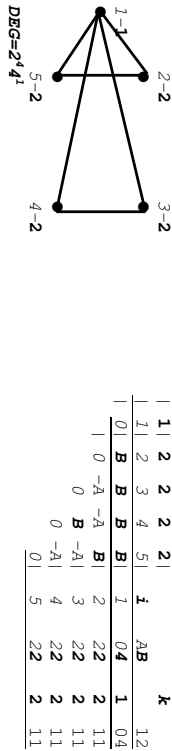
**Graph GS(5.6.3) and its complement GS(5.4.3)** (Graph Atlas GS42 and GS28)

Common invariants and measures of the structure and its complement:

GS	K	N	SVV	SV	SRV	HR	SR	aut	84PS
Partial	2	3	$1^4 1$	$0.6891$	$2^4 4^2$	$0.4581$	$0.5419$	8	6

GS(5.6.3), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

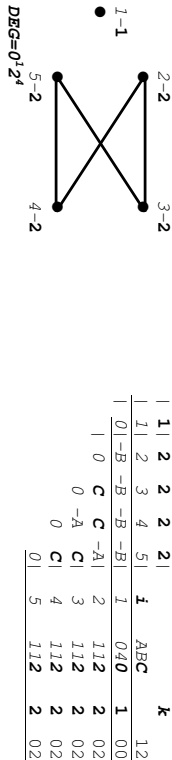
A:  $-2.3.2$ ; B:  $+2.3.3$ .



	1	2	2	2	2	1	f	AB	k
1	1	1	2	3	4	5	1	04	12
2	0	B	B	B	B	B	1	04	104
3	0	-A	-A	B	2	22	2	22	211
4	0	B	-A	3	22	2	2	22	211
5	0	-A	4	4	22	2	2	22	211
1	0	1	5	5	22	2	2	22	211

GS(5.4.3) (complement of GS(5.6.3)), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-2.4.4$ ; B:  $-0.2.0$ ; C:  $+3.4.4$ .



	1	1	2	2	2	2	1	f	ABC	k
1	1	1	2	3	4	5	1	040	1	00
2	0	-B	-B	-B	-B	1	040	1	00	100
3	0	C	C	-A	2	112	2	02	2	02
4	0	-A	C	1	3	112	2	02	2	02
5	0	C	4	4	4	112	2	02	2	02
1	0	1	5	5	112	2	2	02	2	02

Distinguishing invariants and measures:

GS	E	N'	N	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5.6.3)	6	2	1	$2^4 1$	$0.6901$	3	3	2	ep	$1.000$	0
GS(5.4.3)	4	1	2	$4^1$	$1.000$	2	4	2	bp	0	0

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	$adj_n$	1	2
GS(5.7.4)	$adj_n$	1	2
GS(5.6.3)	$upp_n$	2.2	-
GS(5.6.3)	$k.k'$	4/4	-
GS(5.5.3)	$PF_n$	2.2	1.2
GS(5.5.3)	$LOW_n$	2/6	4/6
GS(5.5.2)	$PF_n$	2.2	1.2
GS(5.5.2)	$upp_n$	2.2	1.2
GS(5.5.2)	$k.k'$	2/6	4/6
GS(5.3.4)	$PF_n$	2.2	-
GS(5.3.4)	$LOW_n$	2.2	-
GS(5.4.3)	$k.k'$	4/4	-
GS(5.4.3)	$PF_n$	4/4	-

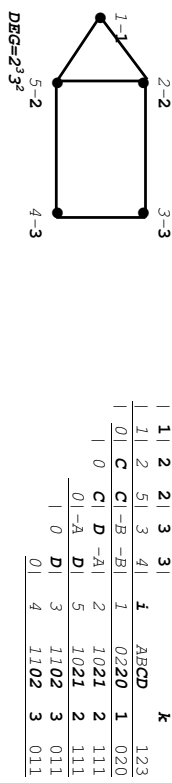
**Graph GS(5.6.4) and its complement GS(5.4.4)** (by Graph Atlas G43 and G31)

Common invariants and measures of the structure and its complement:

GS	K	N	SVV	SV	SRV	HR	SR	aut	84PS
Partial	3	6	$1^2 2$	$0.3445$	$1^2 2^4$	$0.7592$	$0.2408$	2	24

GS(5.6.4), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

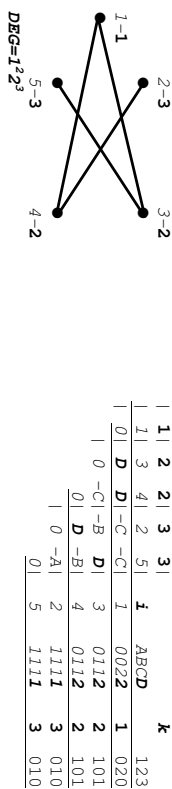
A:  $-2.4.4$ ; B:  $-2.3.2$ ; C:  $+2.3.3$ ; D:  $+3.4.4$ .



	1	1	2	2	3	3	1	f	ABCD	k
1	1	1	2	5	3	4	1	0220	1	020
2	0	C	-B	-B	1	0220	1	020	1	020
3	0	C	D	-A	2	1021	2	111	2	111
4	0	-A	D	5	1021	2	111	2	111	111
5	0	D	3	3	1102	3	011	3	011	011
1	0	1	4	4	1102	3	011	3	011	011

GS(5.4.4) (complement of GS(5.6.4)), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-4.5.4$ ; B:  $-3.4.3$ ; C:  $-2.3.2$ ; D:  $+1.2.1$ .



	1	1	2	2	3	3	1	f	ABCD	k
1	1	1	3	4	2	5	1	0922	1	020
2	0	-C	-B	D	3	0112	2	101	2	101
3	0	D	-B	4	0112	2	101	2	101	101
4	0	-A	2	1111	3	010	3	010	3	010
5	0	-A	2	1111	3	010	3	010	3	010
1	0	1	5	5	1111	3	010	3	010	010

Distinguishing invariants and measures:

GS	E	N'	N	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5.6.4)	6	4	2	$1^2 2^2$	$0.2579$	3	3	2	hp	$0.500$	0
GS(5.4.4)	4	2	4	$2^2$	$0.500$	2	0	4	bp <u>cu</u>	0	$1.000$

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	$adj_n$	1	2	3	4
GS(5.7.3)	$adj_n$	1	2	3	4
GS(5.7.4)	$upp_n$	1.3	2.3	-	-
GS(5.6.4)	$k.k'$	2/4	2/4	-	-
GS(5.5.1)	$PF_n$	2.2	3.3	1.2	2.3
GS(5.5.1)	$LOW_n$	2.2	3.3	1.2	2.3
GS(5.5.1)	$k.k'$	1/6	1/6	2/6	2/6
GS(5.5.1)	$upp_n$	3.3	2.2	2.3	1.3
GS(5.5.1)	$k.k'$	3.3	2.2	2.3	1.3
GS(5.5.1)	$PF_n$	1/6	1/6	2/6	2/6
GS(5.3.3)	$PF_n$	1.2	2.3	-	-
GS(5.3.3)	$LOW_n$	1.2	2.3	-	-
GS(5.3.4)	$k.k'$	2/4	2/4	-	-
GS(5.3.4)	$PF_n$	2/4	2/4	-	-

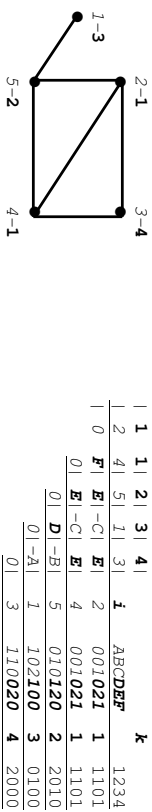
**Graph GS(5.6.5) and its complement GS(5.4.5)** (by Graph Atlas G41 and G30)

Common invariants and measures of the structure and its complement:

GS	K	N	SVV	SV	SRV	HR	SR	aut	84PS
Partial	4	7	$1^3 2^1$	$0.3529$	$1^4 2^3$	$0.8194$	$0.1806$	2	24

GS(5.6.5), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

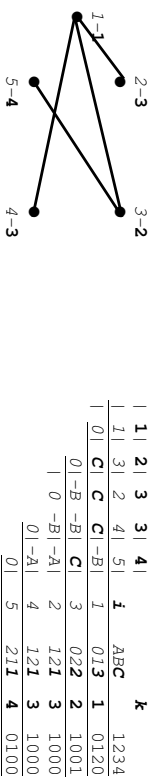
A:  $-3.5.6$ ; B:  $-2.4.5$ ; C:  $-2.3.2$ ;  
D:  $+1.2.1$ ; E:  $+2.3.3$ ; F:  $+2.4.5$ .



	1	2	3	4	k									
1	1	1	2	3	4	1	ABCD $\bar{E}$ F	1234						
2	4	5	1	3	1	0	$\bar{E}$ 1-C $\bar{E}$	2	001021	1	1101			
3	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	2	001021	1	1101	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	4	001021	1	1101
4	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	2	001021	1	1101	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	4	001021	1	1101
5	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	2	001021	1	1101	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	4	001021	1	1101
1-3	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	2	001021	1	1101	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	4	001021	1	1101
2-1	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	2	001021	1	1101	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	4	001021	1	1101
2-4	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	2	001021	1	1101	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	4	001021	1	1101
3-4	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	2	001021	1	1101	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	4	001021	1	1101
4-1	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	2	001021	1	1101	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	4	001021	1	1101
5-2	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	2	001021	1	1101	0	$\bar{E}$ 1-C $\bar{E}$	$\bar{E}$	4	001021	1	1101

GS(5.4.5) (complement of GS(5.6.5)), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-3.4.3$ ; B:  $-2.3.2$ ; C:  $+1.2.1$ .



	1	2	3	4	k														
1	1	1	2	3	4	1	ABC	1234											
2	1	1	2	3	4	5	1	013	1	0120									
3	0	1	C	C	-B	1	013	1	0120	0	-B	-B	C	3	022	2	1001		
4	0	1	0	-B	-A	1	0	-B	-A	2	121	3	1000	0	-A	1	1000		
5	0	1	0	-A	1	4	121	3	1000	0	-A	1	1000	0	1	5	211	4	0100

Distinguishing invariants and measures:

GS	E	N'	N	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5.6.5)	6	4	3	$1^2 2^2$	$0.2579$	3	3	3	P	$0.833$	$0.167$
GS(5.4.5)	4	3	4	$1^2 2^1$	$0.2500$	2	0	3	p $\bar{p}$ u	0	$1.000$

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	$adj_n$	1	2	3	4
	$upp_n$	GS(5.7.2)	GS(5.7.3)	GS(5.7.4)	-
	$k.k'$	2.4	3.4	1.3	-
GS(5.6.5)	$PF_n$	$1/4$	$1/4$	$2/4$	-
	$low_n$	GS(5.5.2)	GS(5.5.4)	GS(5.5.5)	GS(5.5.6)
	$k.k'$	2.3	1.4	1.1	1.2
	$PF_n$	$1/6$	$2/6$	$1/6$	$2/6$
	$upp_n$	GS(5.5.3)	GS(5.5.4)	GS(5.5.5)	GS(5.5.6)
	$k.k'$	1.4	2.3	1.3	3.3
	$PF_n$	$1/6$	$2/6$	$2/6$	$1/6$
GS(5.4.5)	$low_n$	GS(5.3.2)	GS(5.3.3)	GS(5.3.4)	-
	$k.k'$	2.4	1.2	1.3	-
	$PF_n$	$1/4$	$1/4$	$2/4$	-

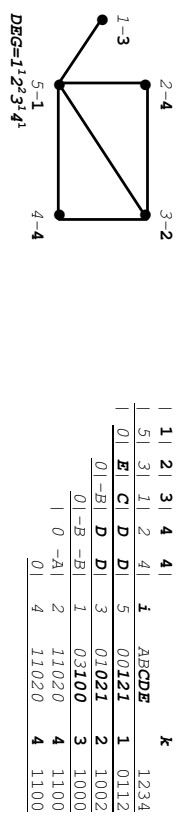
**Graph GS(5.6.6) and its complement GS(5.4.6)** (by Graph Atlas G40 and G27)

Common invariants and measures of the structure and its complement:

GS	K	N	SVV	SV	SRV	HR	SR	aut	84PS
Partial	4	7	$1^3 2^1$	$0.3529$	$1^4 2^3$	$0.8194$	$0.1806$	2	24

GS(5.6.6), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

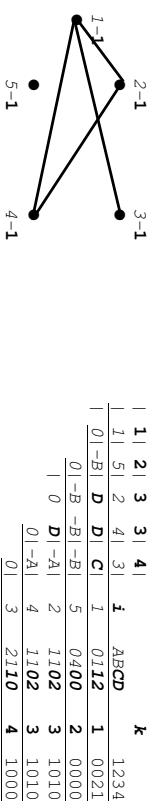
A:  $-2.4.5$ ; B:  $-2.3.2$ ; C:  $+1.2.1$ ; D:  $+2.3.3$ ; E:  $+2.4.5$ .



	1	2	3	4	k				
1	1	1	2	3	4	1	ABCDE	1234	
2	5	1	1	2	4	1	00121	1	0112
3	0	$\bar{E}$ 1	C	D	D	5	01021	2	1002
4	0	$\bar{E}$ 1	C	D	D	3	01021	3	1000
5	0	$\bar{E}$ 1	C	D	D	3	03100	3	1000
1-3	0	$\bar{E}$ 1	C	D	D	3	03100	3	1000
2-4	0	$\bar{E}$ 1	C	D	D	3	03100	3	1000
3-2	0	$\bar{E}$ 1	C	D	D	3	03100	3	1000
4-4	0	$\bar{E}$ 1	C	D	D	3	03100	3	1000
5-1	0	$\bar{E}$ 1	C	D	D	3	03100	3	1000

GS(5.4.6) (complement of GS(5.6.6)), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-2.3.2$ ; B:  $-0.2.0$ ; C:  $+1.2.1$ ; D:  $+2.3.3$ .



	1	2	3	4	k														
1	1	1	2	3	4	1	ABCD	1234											
2	1	1	2	3	4	3	1	0112	1	0021									
3	0	1	-B	D	D	1	0112	1	0021	0	-B	-B	D	5	0400	2	0000		
4	0	1	0	-B	-B	1	0	-B	-B	2	1102	3	1010	0	-A	1	1020	4	1100
5	0	1	0	-A	1	4	1102	3	1010	0	-A	1	1020	4	11020	4	1100		

Distinguishing invariants and measures:

GS	E	N'	N	SEV	SE	MC	MG	dm	type	TRA	BRA
GS(5.6.6)	6	4	3	$1^2 2^2$	$0.2579$	3	3	2	P	$0.833$	$0.167$
GS(5.4.6)	4	3	4	$1^2 2^1$	$0.2500$	3	3	2	p	$0.750$	$0.250$

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

GS	$adj_n$	1	2	3	4
	$upp_n$	GS(5.7.1)	GS(5.7.2)	GS(5.7.4)	-
	$k.k'$	2.3	4.4	3.4	-
GS(5.6.6)	$PF_n$	$1/4$	$1/4$	$2/4$	-
	$low_n$	GS(5.5.2)	GS(5.5.3)	GS(5.5.4)	GS(5.5.5)
	$k.k'$	1.3	2.4	1.4	1.2
	$PF_n$	$1/6$	$2/6$	$2/6$	$1/6$
	$upp_n$	GS(5.5.2)	GS(5.5.3)	GS(5.5.4)	GS(5.5.6)
	$k.k'$	3.4	1.2	2.3	2.4
	$PF_n$	$2/6$	$1/6$	$2/6$	$1/6$
GS(5.4.6)	$low_n$	GS(5.3.1)	GS(5.3.2)	GS(5.3.4)	-
	$k.k'$	1.4	3.3	1.3	-
	$PF_n$	$1/4$	$1/4$	$2/4$	-

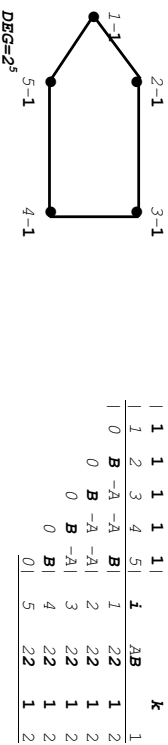
### Self-complemented graph-structure $GS(5.5.1)$ (by Graph Atlas G38)

Common invariants and measures of the structure and its complement:

$GS$	$K$	$N$	$SVV$	$SV$	$SRV$	$HR$	$SR$	$aut$	$8APS$
Symmetric	1	2	$5^1$	$1.000$	$5^2$	$0.3010$	$0.6989$	10	4

$GS(5.5.1a)$ , its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

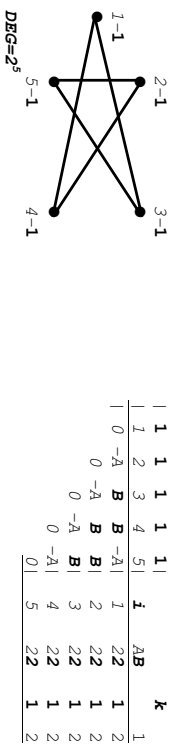
$A: -2, 3, 2; B: +4, 5, 5.$



	1	1	1	1	1	$k$
1	1	2	3	4	5	1
1	0	$B$	$-A$	$-A$	$B$	1
0	0	$B$	$-A$	$-A$	$B$	2
0	0	$B$	$-A$	$-A$	$B$	3
0	0	$B$	$-A$	$-A$	$B$	4
0	0	$B$	$-A$	$-A$	$B$	5
0	0	$B$	$-A$	$-A$	$B$	2
0	0	$B$	$-A$	$-A$	$B$	1
0	0	$B$	$-A$	$-A$	$B$	2

$GS(5.5.1b)$  (complement of  $GS(5.5.1a)$ ), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

$A: -2, 3, 2; B: +4, 5, 5.$



	1	1	1	1	1	$k$
1	1	2	3	4	5	1
1	0	$-A$	$B$	$B$	$-A$	1
0	0	$-A$	$B$	$B$	$-A$	2
0	0	$-A$	$B$	$B$	$-A$	3
0	0	$-A$	$B$	$B$	$-A$	4
0	0	$-A$	$B$	$B$	$-A$	5
0	0	$-A$	$B$	$B$	$-A$	2
0	0	$-A$	$B$	$B$	$-A$	1
0	0	$-A$	$B$	$B$	$-A$	2

Coincidence of invariants and measures:

$GS$	$ E $	$N'$	$N''$	$SEV$	$SE$	$MC$	$MG$	$dm$	type	TRA	BR
$GS(5.5.1a)$	5	1	1	$5^1$	$1.000$	2	5	2	$ehp$	0	0
$GS(5.5.1b)$	5	1	1	$5^1$	$1.000$	2	5	2	$ehp$	0	0

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

$GS$	$adj_n$	$1$
$GS(5.5.1a)$	$upp_n$	$GS(5.6.4)$
	$k.k'$	1.1
	$PF_n$	5/5
	$low_n$	$GS(5.4.4)$
	$k.k'$	1.1
	$PF_n$	5/5
	$upp_n$	$GS(5.6.4)$
	$k.k'$	1.1
	$PF_n$	5/5
	$low_n$	$GS(5.4.4)$
	$k.k'$	1.1
	$PF_n$	5/5

### Graph $GS(5.5.2)$ and its complement $GS(5.5.3)$ (by Graph Atlas G33 and G34)

Common invariants and measures of the structure and its complement:

$GS$	$K$	$N$	$SVV$	$SV$	$SRV$	$HR$	$SR$	$aut$	$8APS$
Partial	3	5	$1^{12}$	$0.3445$	$1^{22}4^1$	$0.6388$	$0.3612$	4	10

$GS(5.5.2)$ , its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

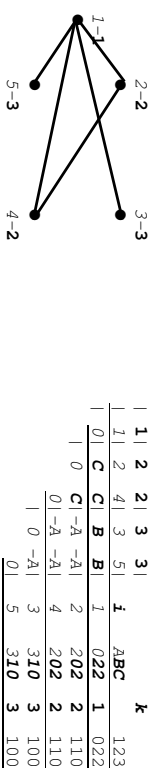
$A: -2, 4, 5; B: -0, 2, 0; C: +2, 3, 3; D: +2, 4, 5.$



	1	1	2	3	3	$k$
1	3	5	1	2	4	1
1	0	$D$	$-B$	$C$	$C$	3
0	0	$-B$	$C$	$C$	5	0.121
0	0	$-B$	$-B$	1	0.400	2
1	0	$-A$	2	1.120	3	200
0	0	$-A$	2	1.120	3	200
0	0	$-A$	2	1.120	3	200
0	0	$-A$	2	1.120	3	200
0	0	$-A$	2	1.120	3	200
0	0	$-A$	2	1.120	3	200

$GS(5.5.3)$  (complement of  $GS(5.5.2)$ ), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

$A: -2, 3, 2; B: +1, 2, 1; C: +2, 3, 3.$



	1	1	2	2	3	3	$k$
1	1	2	4	3	5	1	
1	0	$C$	$B$	$B$	1	0.22	
1	0	$C$	$-A$	$-A$	2	2.02	
0	0	$-A$	$-A$	4	2.02	2	
1	0	$-A$	3	3.10	3	100	
0	0	$-A$	3	3.10	3	100	
0	0	$-A$	3	3.10	3	100	
0	0	$-A$	3	3.10	3	100	
0	0	$-A$	3	3.10	3	100	
0	0	$-A$	3	3.10	3	100	

Distinguishing invariants and measures:

$GS$	$ E $	$N'$	$N''$	$SEV$	$SE$	$MC$	$MG$	$dm$	type	TRA	BR
$GS(5.5.2)$	5	2	3	$1^{14}$		3	3	2	$p$	$1.000$	0
$GS(5.5.3)$	5	3	2	$1^{12}$	$0.4047$	3	3	2	$p$	$0.600$	$0.400$

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

$GS$	$adj_n$	$1$	$2$	$3$
$GS(5.5.2)$	$upp_n$	$GS(5.6.1)$	$GS(5.6.5)$	$GS(5.6.6)$
	$k.k'$	3.3	2.3	1.2
	$PF_n$	1/5	2/5	2/5
	$low_n$	$GS(5.4.3)$	$GS(5.4.6)$	-
	$k.k'$	1.1	1.3	-
	$PF_n$	1/5	4/5	-
	$upp_n$	$GS(5.6.3)$	$GS(5.6.6)$	-
	$k.k'$	3.3	2.3	-
	$PF_n$	1/5	4/5	-
	$low_n$	$GS(5.4.1)$	$GS(5.4.5)$	$GS(5.4.6)$
	$k.k'$	2.2	1.2	1.3
	$PF_n$	1/5	2/5	2/5

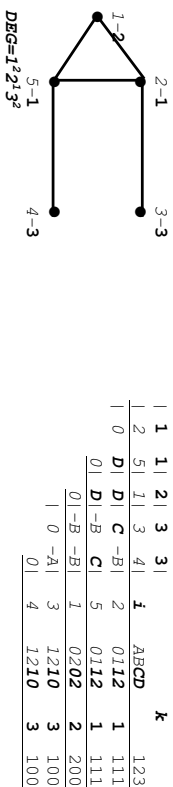
### Self-complemented graph-structure $GS(5.5.4)$ (by Graph Atlas G35)

Common invariants and measures of the structure and its complement:

$GS$	$K$	$N$	$SVV$	$SV$	$SRV$	$HR$	$SR$	$aut$	$84PS$
Partial	3	6	$112^2$	$0.3445$	$1^22^4$	$0.7592$	$0.2408$	2	20

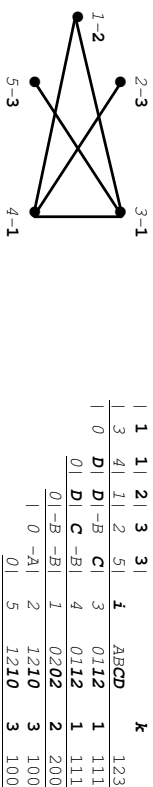
$GS(5.5.4a)$ , its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-3.4.3$ ; B:  $-2.3.2$ ; C:  $+1.2.1$ ; D:  $+2.3.3$ .



$GS(5.5.4b)$  (complement of  $GS(5.5.4a)$ ), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-3.4.3$ ; B:  $-2.3.2$ ; C:  $+1.2.1$ ; D:  $+2.3.3$ .



Coincidence of invariants and measures:

$GS$	$ E $	$N'$	$N''$	$SEV$	$SE$	$MC$	$MG$	$dm$	$type$	$TRA$	$BRA$
$GS(5.5.4a)$	5	3	3	$11^22$	$0.4047$	3	3	3	$P$	$0.600$	$0.400$
$GS(5.5.4b)$	5	3	3	$11^22$	$0.4047$	3	3	3	$P$	$0.600$	$0.400$

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

$GS$	$adj_n$	1	2	3
$GS(5.5.4a)$	$upp_n$	$GS(5.6.4)$	$GS(5.6.5)$	$GS(5.6.6)$
	$k.k'$	3.3	2.3	1.3
	$PF_n$	$1/5$	$2/5$	$2/5$
$GS(5.5.4b)$	$low_n$	$GS(5.4.4)$	$GS(5.4.5)$	$GS(5.4.6)$
	$k.k'$	1.1	1.2	1.3
	$PF_n$	$1/5$	$2/5$	$2/5$
$GS(5.5.4b)$	$upp_n$	$GS(5.6.4)$	$GS(5.6.5)$	$GS(5.6.6)$
	$k.k'$	3.3	2.3	1.3
	$PF_n$	$1/5$	$2/5$	$2/5$
$GS(5.5.4.4)$	$low_n$	$GS(5.4.4)$	$GS(5.4.5)$	$GS(5.4.6)$
	$k.k'$	1.1	1.2	1.3
	$PF_n$	$1/5$	$2/5$	$2/5$

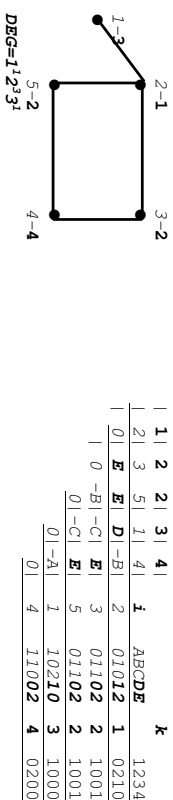
### Graph $GS(5.5.5)$ and its complement $GS(5.5.6)$ (by Graph Atlas G37 and G36)

Common invariants and measures of the structure and its complement:

$GS$	$K$	$N$	$SVV$	$SV$	$SRV$	$HR$	$SR$	$aut$	$84PS$
Partial	4	7	$1^32^1$	$0.3529$	$1^42^3$	$0.8194$	$0.1806$	2	20

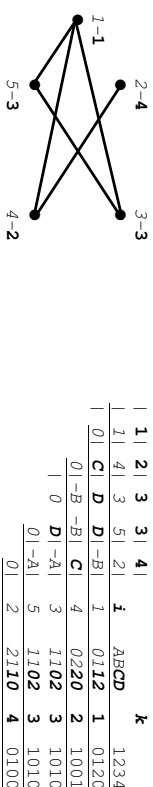
$GS(5.5.5)$ , its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-3.5.5$ ; B:  $-2.4.4$ ; C:  $-2.3.2$ ; D:  $+1.2.1$ ; E:  $+3.4.4$ .



$GS(5.5.6)$  (complement of  $GS(5.5.5)$ ), its pair signs and sign matrix  $S$  with  $u$ - and  $s$ -signs:

A:  $-3.4.3$ ; B:  $-2.3.2$ ; C:  $+1.2.1$ ; D:  $+2.3.3$ .



Distinguishing invariants and measures:

$GS$	$ E $	$N'$	$N''$	$SEV$	$SE$	$MC$	$MG$	$dm$	$type$	$TRA$	$BRA$
$GS(5.5.5)$	5	3	4	$11^22$	$0.4047$	2	4	3	$tpu$	0	$0.200$
$GS(5.5.6)$	5	4	3	$1^32^1$	$0.3629$	3	3	3	$P$	$0.6000$	$0.400$

Identifiers of adjacent structures and characteristics of morphisms  $F_n$ :

$GS$	$adj_n$	1	2	3	4
$GS(5.5.5)$	$upp_n$	$GS(5.6.2)$	$GS(5.6.4)$	$GS(5.6.5)$	$GS(5.6.6)$
	$k.k'$	3.4	2.3	2.2	1.4
	$PF_n$	$1/5$	$2/5$	$1/5$	$1/5$
$GS(5.5.6)$	$low_n$	$GS(5.4.3)$	$GS(5.4.4)$	$GS(5.4.5)$	-
	$k.k'$	1.3	1.2	2.4	-
	$PF_n$	$1/5$	$2/5$	$2/5$	-
$GS(5.5.6)$	$upp_n$	$GS(5.6.3)$	$GS(5.6.4)$	$GS(5.6.5)$	-
	$k.k'$	1.4	3.4	2.3	-
	$PF_n$	$1/5$	$2/5$	$2/5$	-
$GS(5.5.4.2)$	$low_n$	$GS(5.4.2)$	$GS(5.4.4)$	$GS(5.4.5)$	$GS(5.4.6)$
	$k.k'$	1.2	1.3	3.3	2.4
	$PF_n$	$1/5$	$2/5$	$1/5$	$1/5$