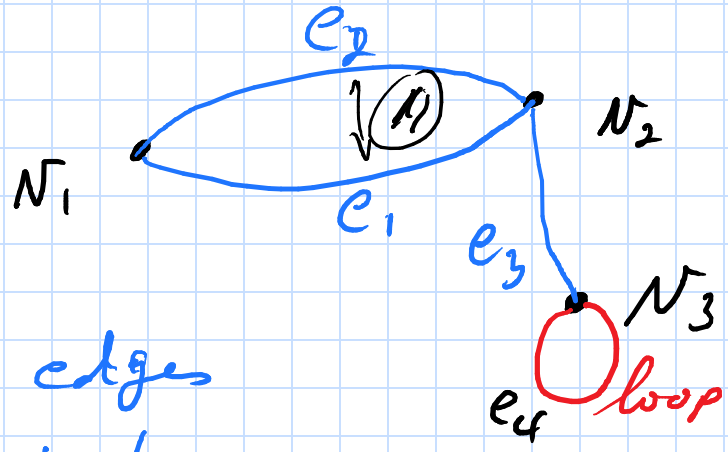


Isolated vertex

v_4

E : edges

V : vertices

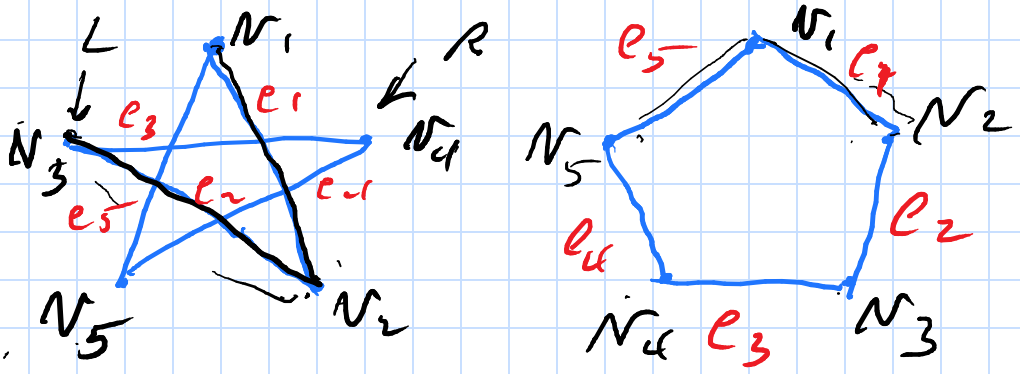
Vertex set: $\{v_1, v_2, v_3, v_4\}$

Edge set $\{e_1, e_2, e_3, e_4\}$

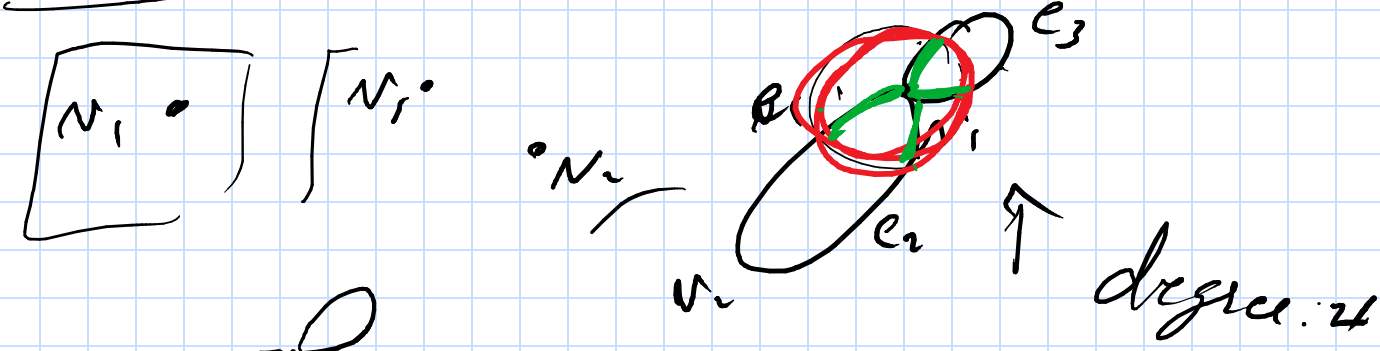
Edge	Endpoints
e_1	$\{v_1, v_2\}$
e_2	$\{v_1, v_2\}$
e_3	$\{v_2, v_3\}$
e_4	$\{v_3\}$

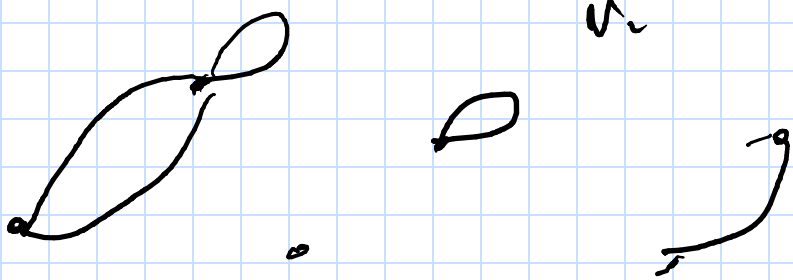
e_1, e_2, e_3 incident of v_2

$e_4 \rightarrow$ loop



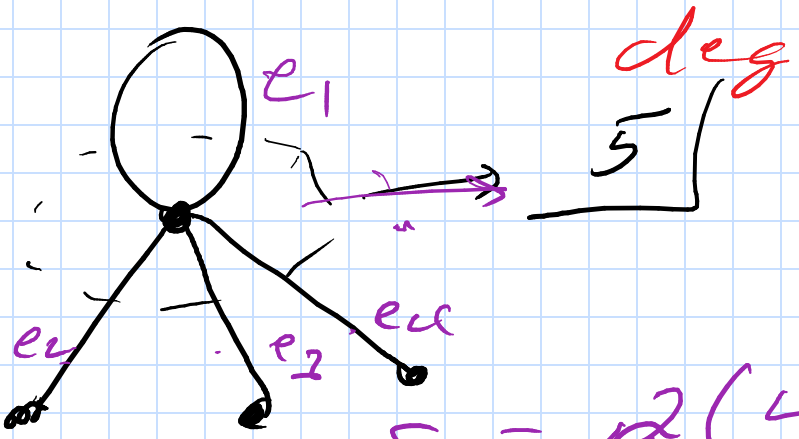
Edge	Endpoints
e_1	$\{N_1, N_2\}$
e_2	$\{N_2, N_3\}$
e_3	$\{N_3, N_4\}$
e_4	$\{N_4, N_5\}$
e_5	$\{N_5, N_1\}$





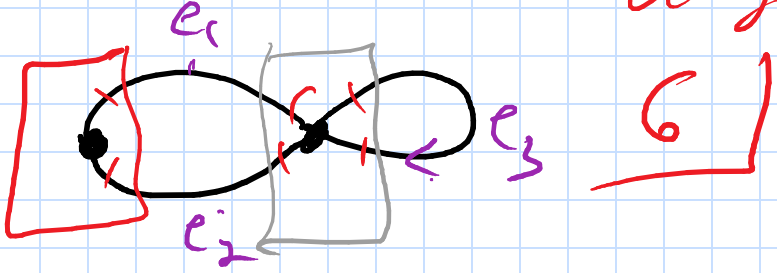
loop = 2 degrees

edge: 1 deg



Total deg $= \delta = 2(4)$

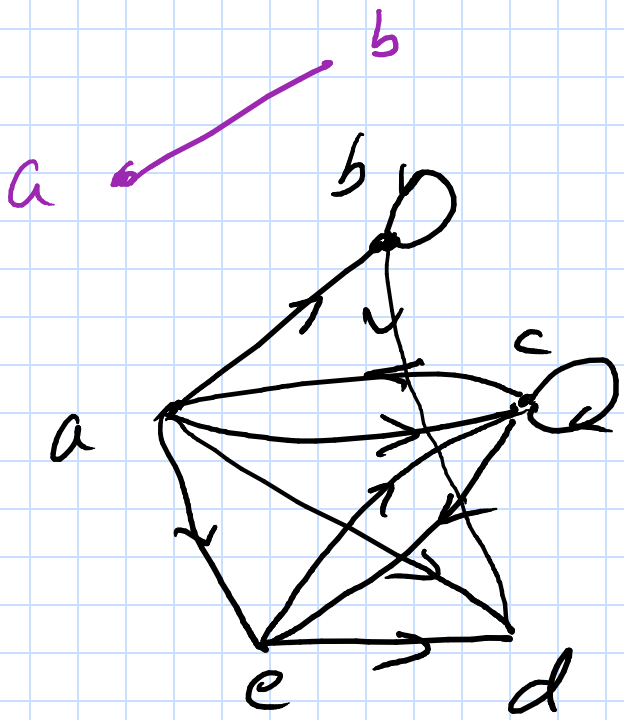
deg Total



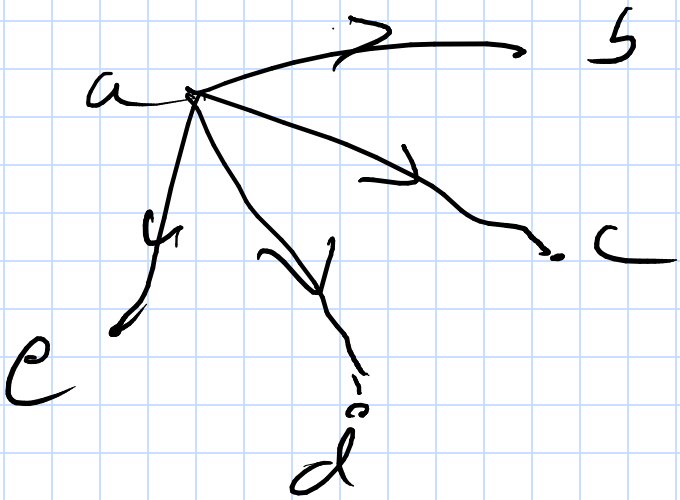
Handshake :

Total degree = 2 × # edges

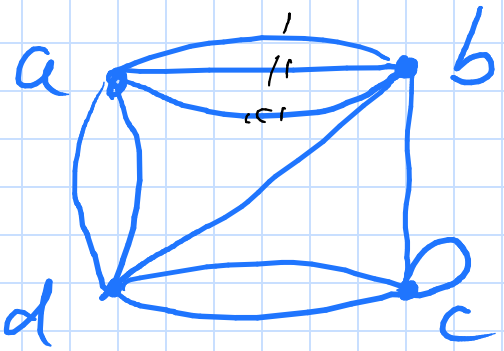
$9 \to 5 = 45$



Initial vertex	Terminal vertex
a	b, c, d, e
b	b, d
c	a, c, e
d	d, c
e	



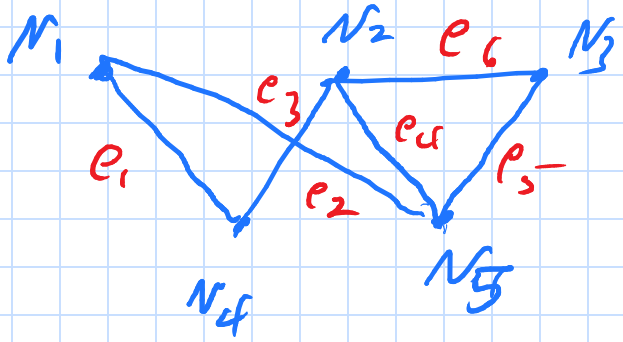
	a	b	c	d	e
a	0	1	1	1	1
b	1	1	0	1	0
c	1	0	1	0	1
d	0	0	0	0	0
e	0	0	1	1	0



	a	b	c	d
a	0	3	0	2
b	3	0	1	1
c	0	1	1	2
d	2	1	2	0

$A = A^T$

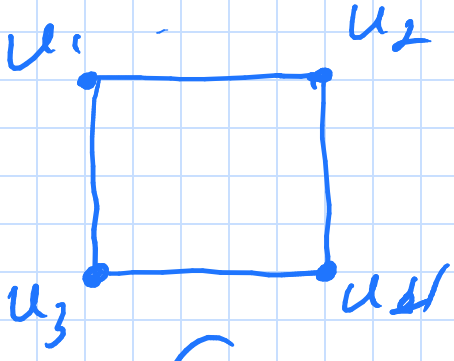
	e_1	e_2	e_3	e_4	e_5	e_6
v_1	1	1	0	0	0	0
v_2	0	0	1	1	0	1
v_3	0	0	0	0	1	1
v_4	1	0	1	0	0	0
v_5	0	1	0	1	1	0



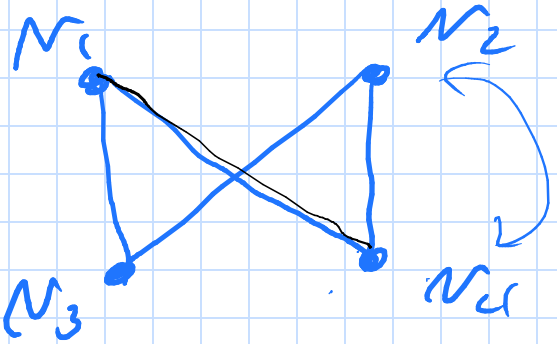
Isomorphism

$G_1 = (V_1, E_1)$ $G_2 = (V_2, E_2)$

$\exists$ 1-1 + onto f c/n $V_1 \to V_2$



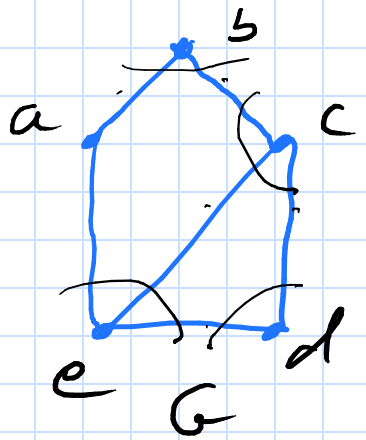
G



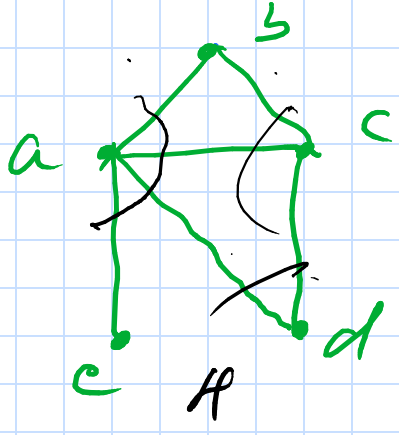
H

$f(u_1) = v_1$ $f(u_3) = v_3$

$f(u_2) = v_4$ $f(u_4) = v_2$



G

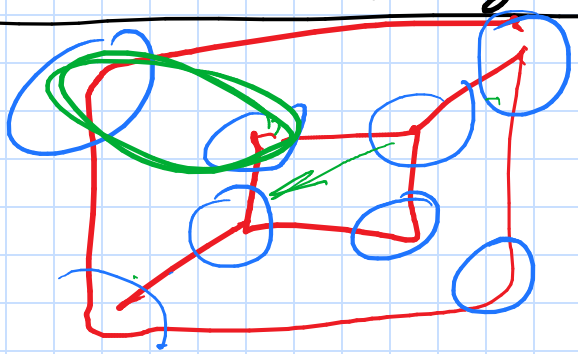


H

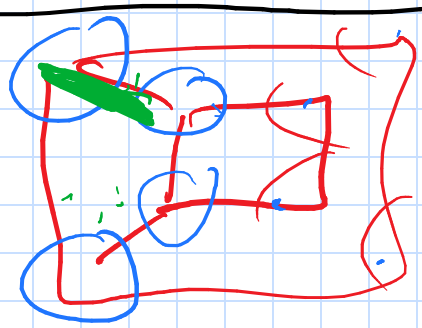
5 vertices, 6 edges.

a { 2 deg. in G
  { 4 deg in H

e { 3 deg in G
  { 1 deg H



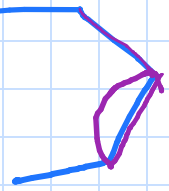
2 deg - d
3 deg - f



2 deg d
3 deg f

4.8

Walk $v_0 e_1 v_1 \cdots v_1$



Trail (walk) no repeated edge

closed walk: $v_0 e_1 v_1 \cdots v_0$

Circuit: closed walk @ least 1 edge
| no repeated edge

simple circuit: no repeat except
$v_1 \cdots v_1$