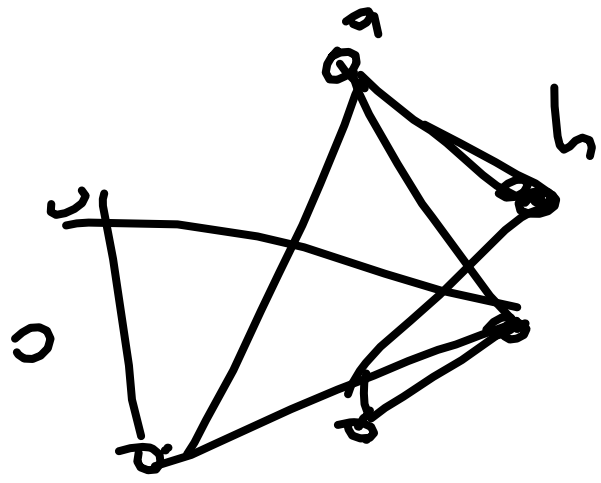
P

Questions 1 & 2.

1)



- Walk from a to b $\ell(w) = p$

$w : x_0 = a, x_1, \dots, x_{p-1}, x_p = b$?

where $x_i x_{i+1} \in E$

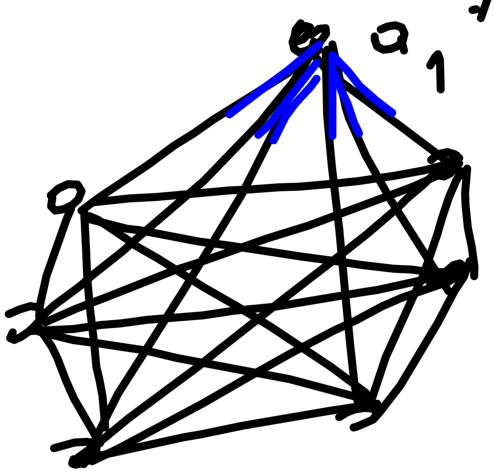
- Trail: walk without repetition of edge.
- Path: walk with no repetition of vertices.

Closed trail ≃ circuit

Closed path: cycle

Q2

K_n, K_7



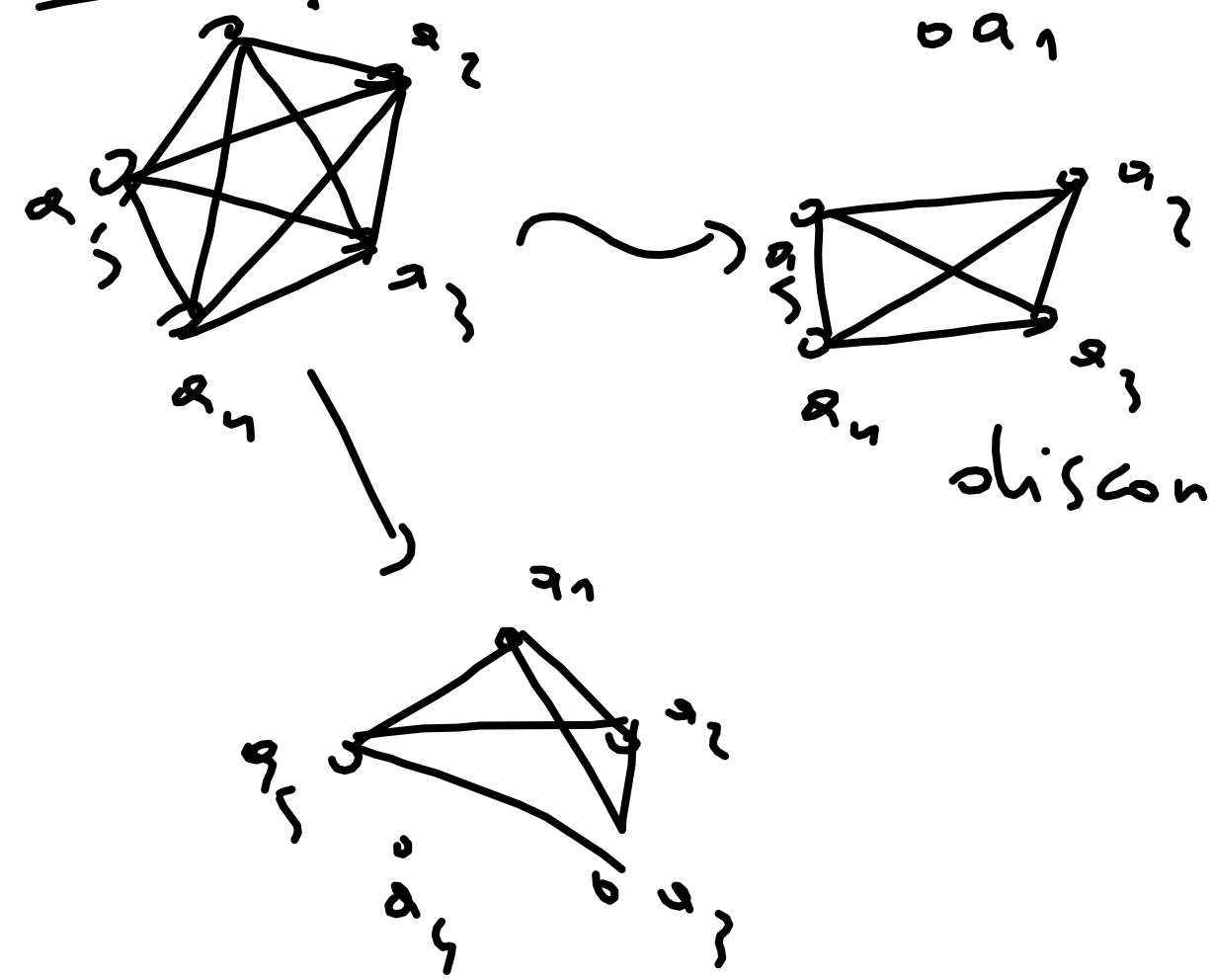
$d(x) = n - 1, \forall x \in V(K_n).$

K_n

n - 1

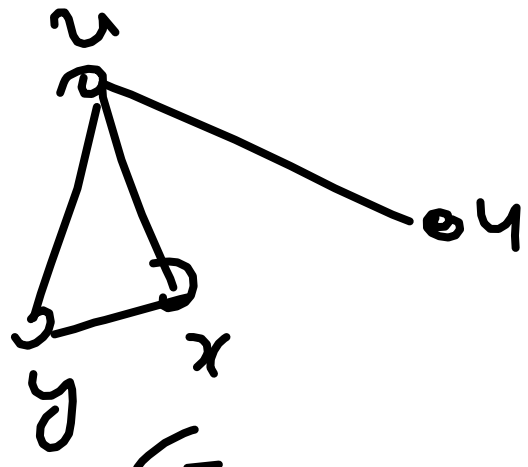
$K_n \setminus \{e_1, \dots, e_{n-1}\} = K_{n-1} \cup \{a_1\}$; a_1 incident with x of $e_1, \dots, e_{n-1}$

Example



disconnected

q3)



G

$\deg(x) = 2$

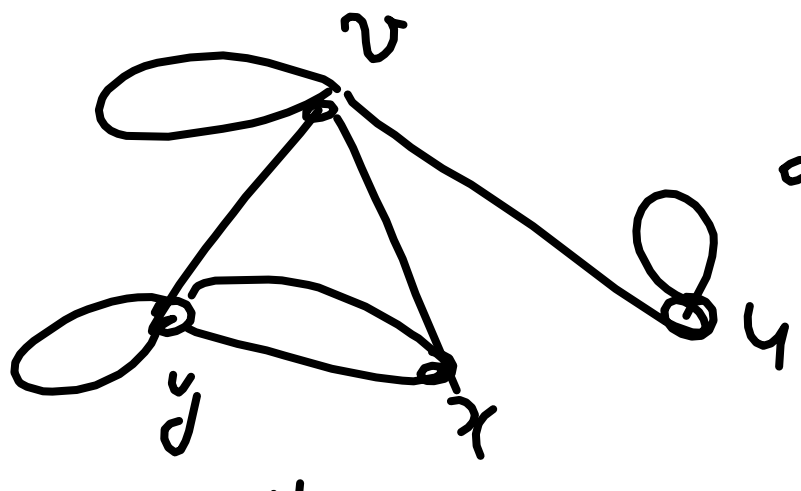
$\deg(y) = 2$

$\deg(u) = 1$

$\deg(v) = 3$

$DEG(G) = (1, 2, 2, 3)$,

xyvx is a 3-cycle.
but $\deg(u) = 1 < 2$



H

t	x	y	u	v
$\deg_H(t)$	3	3	3	5

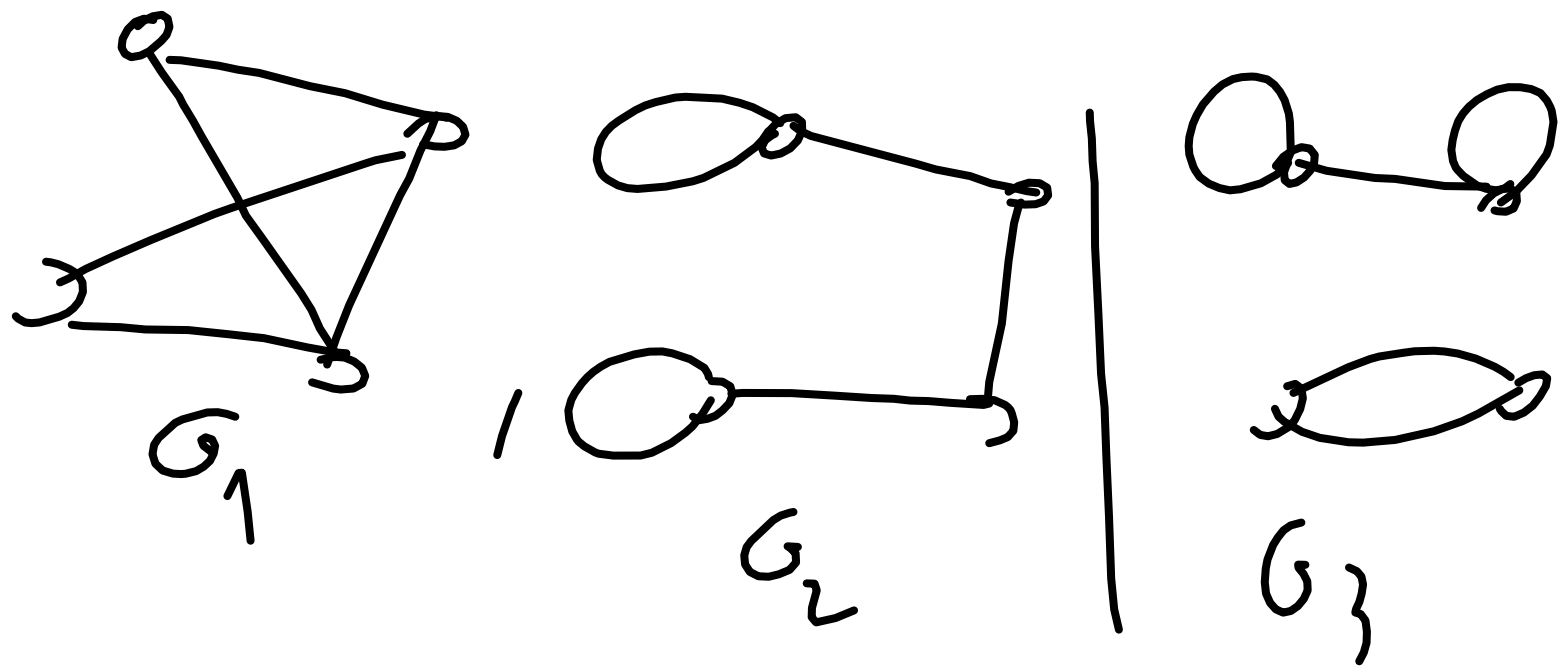
$DEG(H) = (3, 3, 3, 5)$.

Thm: Let $G = (V, E)$ be a graph:
If $\forall x \in V, \deg x \geq 2$, then G contains a cycle.
≡
(If, $\delta(G) \geq 2$, ———)

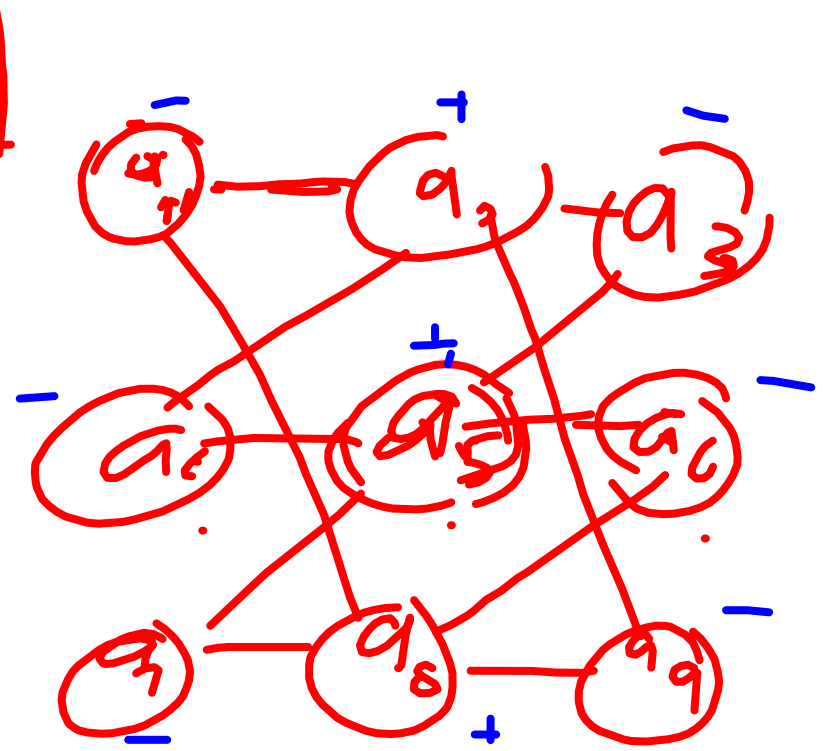
Proof: "in general": Is not correct of:
If G contains a cycle, then $(\forall x \in V, \deg x \geq 2)$

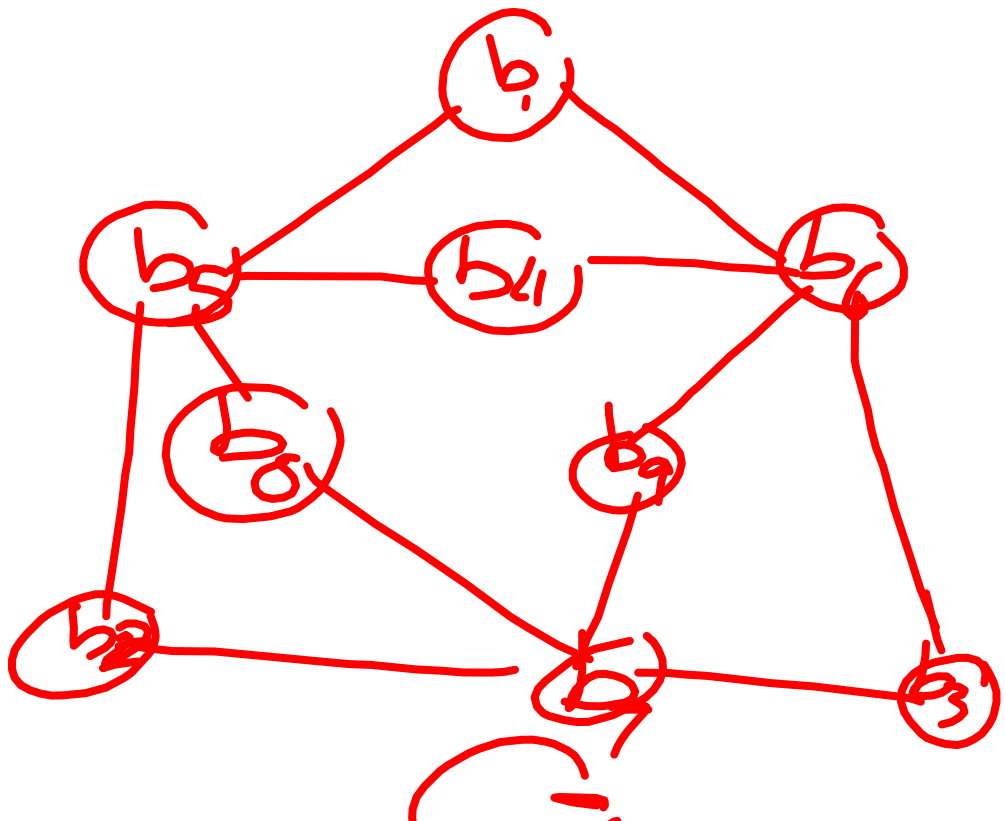
Counterexample

Q4: $D = (2, 2, 3, 3)$

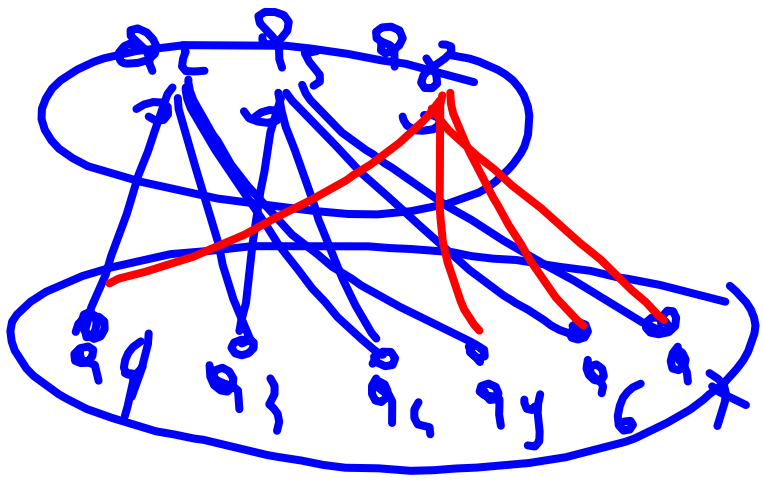


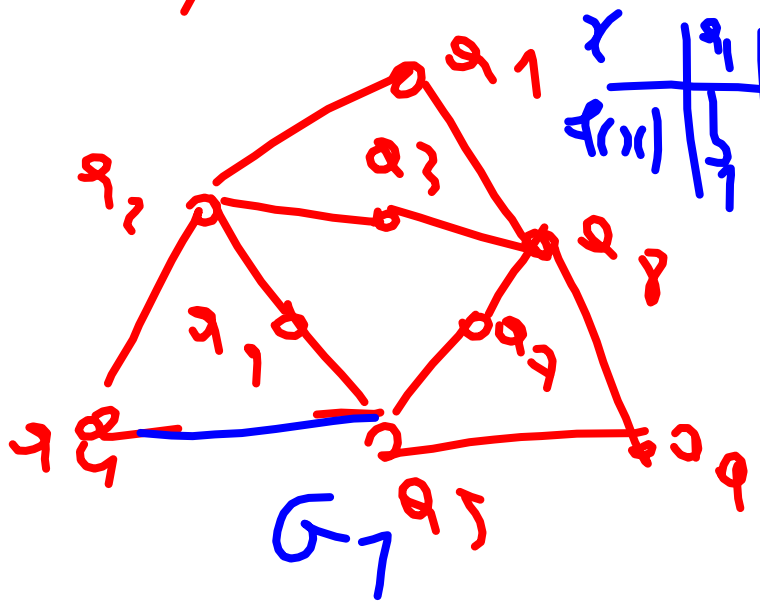
Q:1

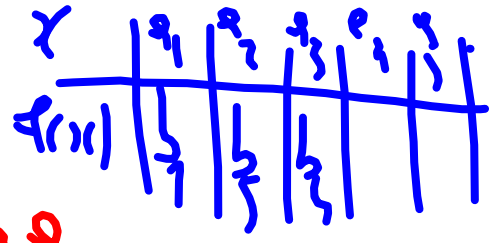




1) $DEG(G_1) = (4,4,4,2,2,2,2,2,2) = DEG(G_2)$.





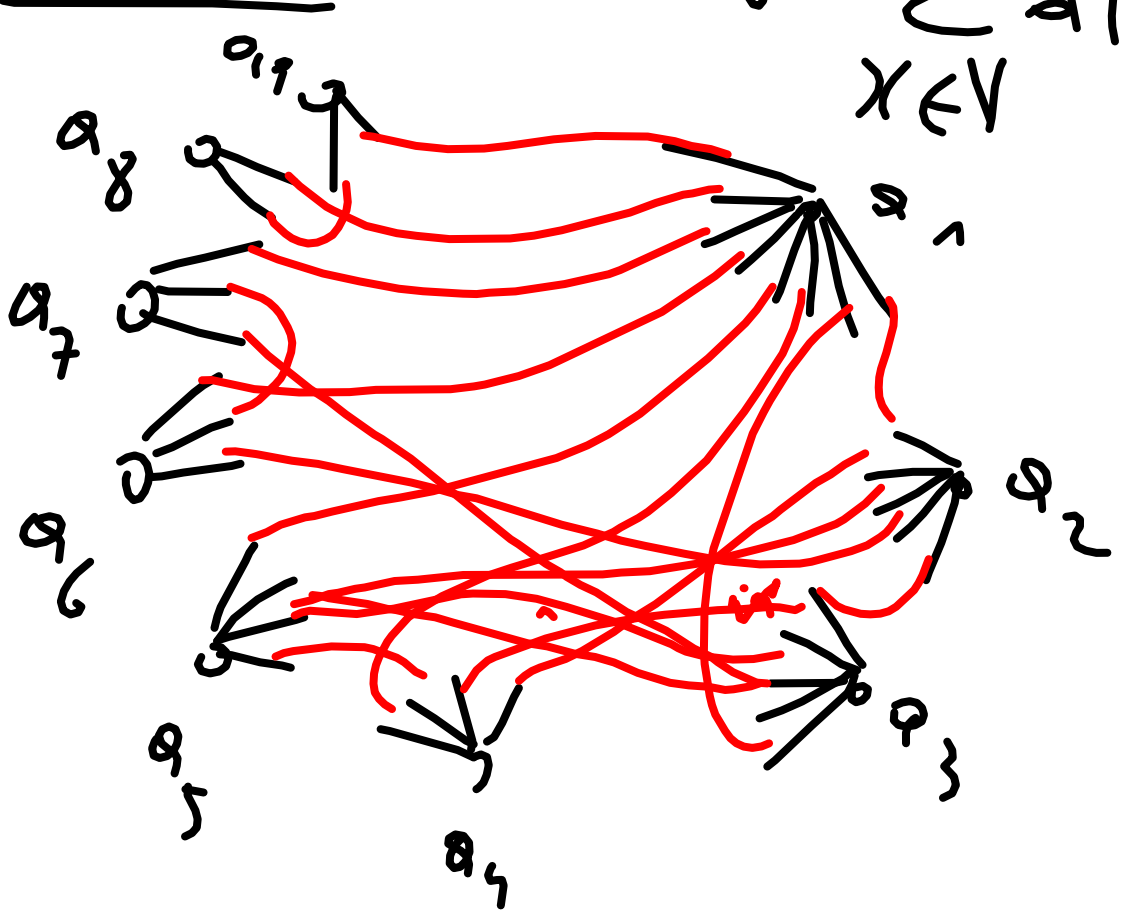


Q6

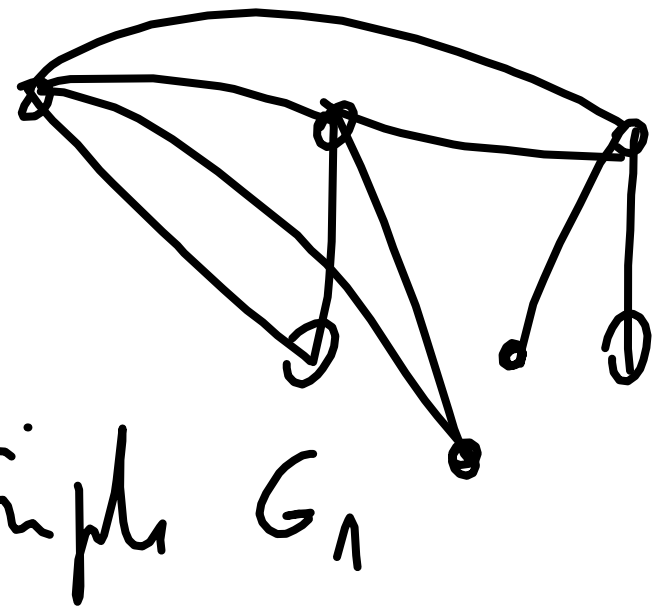
For Quiz 2:

1) Is there a graph G, when $S=(8,5,5,4,4,3,3,2)$ is the sequence of G?

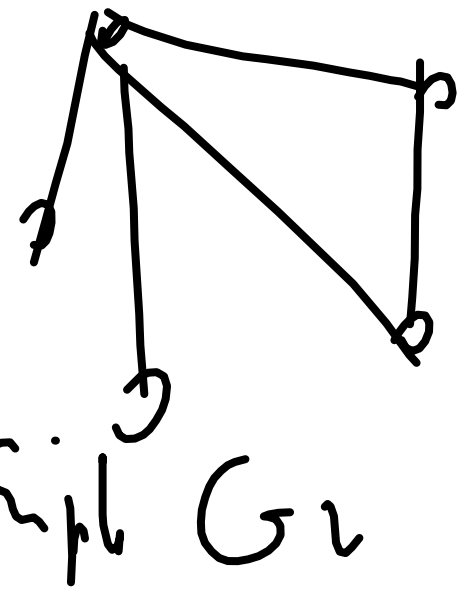
Solution: We have $\sum_{x\in V} d(x) = 8+5+5+4+4+3+3+2+2 = 36 = 2|E| = 2(18)$



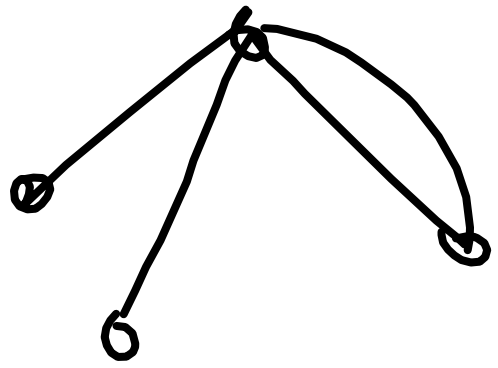
Q2: $D = \{1, 2, 4\}$ set of degrees of G if exist.



simple G_1



simple G_2



Remark: Let $G = (V, E)$ be a graph.

If G is a simple graph, Then $\forall x \in V$, $0 \leq \deg_G x \leq n-1$, $n = |V|$.