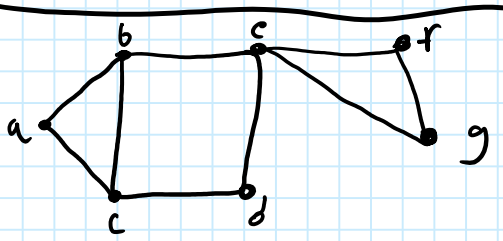
Martin Skalvedt Set -10

1)

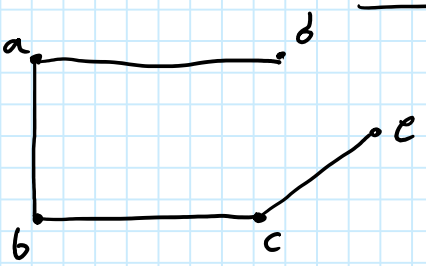


a) b e f g e b c d b) b e f g e d

c) b e d d) b e f g e b

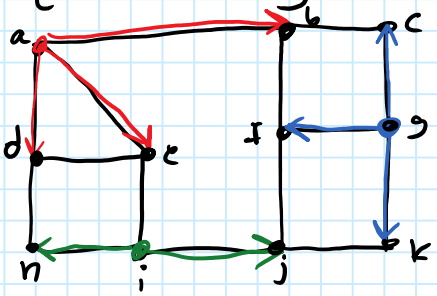
e) b e f g e d c b f) b c d e b

2)



G: {a, b, c, d, e}

3)



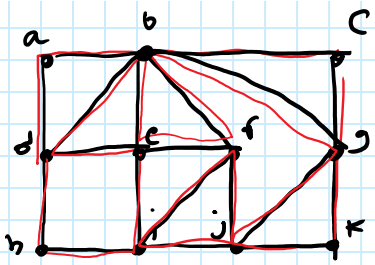
place guards at a, g, i

The smallest number of guards needed is 3

4) a) They are **not** isomorphic

b) They are isomorphic

5)

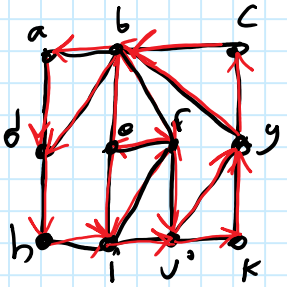


a) vertex-degrees : (2, 6, 2, 4, 4, 4, 4, 2, 4, 4, 2)

since every vertex has an even degree, an example of a euler circuit is:

c, b, a, d, h, e, d, b, e, f, b, g, j, i, f, j, k, g, c

b)



vertex-degrees: (2, 6, 2, 3, 3, 4, 4, 2, 4, 4, 2)

since it has exactly 2 odd numbers an euler-circuit can therefore be.

e, i, f, j, g, b, f, e, b, d, a, b, c, g, k, j, i, h, d

6)a) If there exists $\emptyset \neq U \subseteq V$ such that all the edges in G_1 are on the form $\{x, y\}$, for $x, y \in U$. Then the subgraph G_1 of $G = (V, E)$ is an induced subgraph.

G_1 is not an induced subgraph if it exists an edge $\{x, y\}$ for $x, y \in U$

b) By removing edges $\{b, i\}$, $\{a, d\}$ and $\{c, f\}$ we get a subgraph that is not induced

7) $\sum_{k=1}^{n} \deg(v_k) = 2|E|$

$= \sum_{k=1}^{n} \deg(v_k) = 34$

$34 \geq 3|V| \rightarrow |V| \leq \frac{34}{3}$

$|V| \approx 11$

Maximum $|V|$ is 11