Homework set 11 Sander Lindberg

Exercise 1

Exercises 11.1

2)

d) In a circuit an edge cannot repeat, therefore I have to find a walk that repeats at least one edge:

$B \to E \to G \to F \to E \to B$.

$(\{BE\}, \{EG\}, \{GF\}, \{FE\}, \{BE\})$

e) In a cycle, the vertecies and edges cannot repeat, in a circuit, the vertecies can repeat:

$B \to C \to D \to E \to G \to F \to E \to B$.

$(\{BC\}, \{CD\}, \{DE\}, \{EG\}, \{GF\}, \{FE\}, \{EB\})$

f) ~~No rep~~ No rep edges or vertices:

$B \to A - C \to B$ $(\{BA\}, \{AC\}, \{CB\})$

Exercise 2

Exercises 11.2

8)

b) The number of paths is

$\frac{1}{2}(n(n-1)(n-2)(n-3)\cdots(n-m))$.

Exercise 3

Exercises 11.2

9) a) A, B, G and H are incident with three edges

W, X, Y, Z are also incident with three edges

therefor they could be Incident,

but one form a cycle, while the other

don't, therefor they are not Isomorphic.

b) They are not Isomorphic.

Exercise 4

Exercises 11.3

2) $\sum_{v \in V} \deg(v) = 2|E|$

$\sum_{v \in V} \deg(v) = 17 \cdot 2$, $\deg(v) \geq 3$

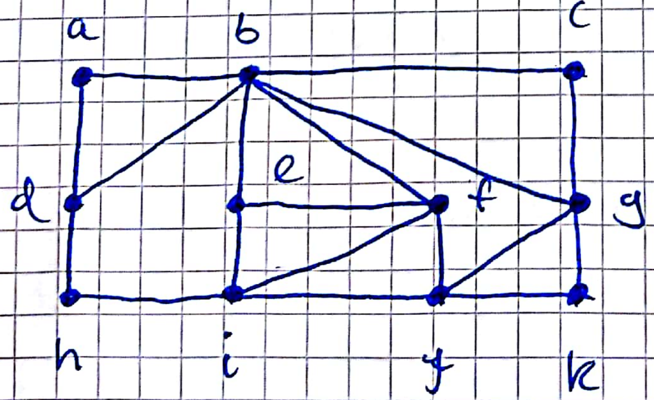
$\sum_{v \in V} \deg(v) = 34$

Since max value has most of the smallest degree, I can have $10 \cdot \deg(v) = 3$
this leaves me with one $\deg(v) = 4$.
therefore $\underline{\underline{|V| = 11}}$

Exercise 5

Exercises 11.3

20) b) (Subgraph of fig. 44)



Euler trail: $d \to a \to b \to d \to h \to i \to e \to f \to i \to j \to f \to b \to c \to g \to k \to j \to g \to b \to e$.

Exercise 6

exercizes 12.1

14) Let $V = \{x, y, w_1, w_2 \dots w_n\}$
be ~~an~~ verticies for $K_{2,n}$, and
$V_1 = \{x, y\}$, $V_2 = \{w_1, w_2 \dots w_n\}$.

all edges have one vertex in V_1 and
the other one in V_2.
T is a spanning tree for $K_{2,n}$ and
has $n+1$ edges and $\deg(x) + \deg(y) = n+1$.
Number ~~to~~ of non isomorphic spanning trees
is $\frac{n+1}{2}$

Exercize 7

Exercizes 12.2

~~2c)~~ 6)

Preorder = 1, 2, 5, 9, 14, 15, 10, 16, 17, 3, 6, 4, 7, 8, 11, 12, 13

Postorder = 14, 15, 9, 16, 17, 10, 5, 2, 6, 3, 7, 11, 12, 13, 8, 4, 1.