Homework

10.1

1.) $2+3+2+1+5+1=14$

b.) $\{(1,2,3,4,6)\}$

c.) 1

d.) 2, 5

e.) No, the degree of each vertex is not the same.

f.) yes Vertices 1, 2, 5 make K^3

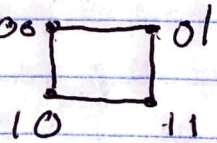
g.) No

4.) a.) 12 edges, yes since each vertices has same degree.

b.) 20 edges, yes all vertex degree = 4.

c.) 3, since K^3 =  but K^4 = 

d.) $n=8$

e.) yes degree = 2 

Homework

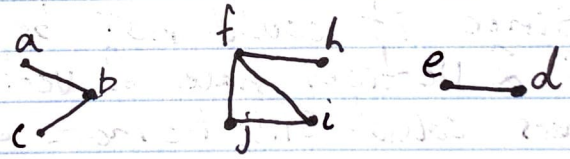
10.2 + 10.4

2.) a.)
1 → 2, 5
2 → 1, 3, 5
3 → 2, 5
4 → 5
5 → 1, 2, 3, 4, 6
6 → 5

b.)
$$\begin{bmatrix} 0 & 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 1 & 1 & 1 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{bmatrix}$$

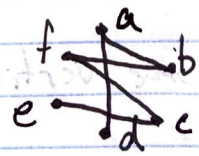
10.4

1.) a.)



b.)

c.)



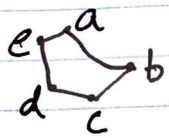
2.) a.) Edge = 3
Vertex = 1

b.) Edge = 5
Vertex = 3

Homework

10.4 + 10.5

4.) a.) If they are 2 edge connected, the graph can be drawn, for example, like this.



with this graph we see if we take any 2 edges off, it seperates. Thus every pair is 2 edge connected

b.) yes it is transitive since if there is a walk from v to w, then there is a path from v to w.

c.) No since it could not be regular and if 2 vertices have 2 vertex connection, then others could still be more or less.

10.5

1.) a.) Here is Euler circuit: {(a, b, c, d, e, a, c, f, d, a)}

b.) Not a Euler circuit since some vertices have odd degrees: b, f,

Homework

- 16.6 + 16.7

1.) a.) m, h, l, p

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

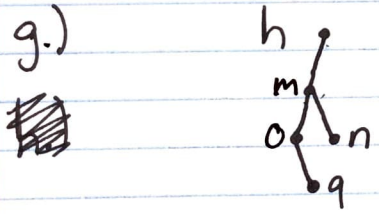
c.) j, q, n, k, e, a, b, c

d.) 4

e.) 5

f.) m, e, d

g.)



h.) l, k

16.7

1.) a.)

O	O	
	O	X
X	O	X

Leaf

O	O	O
		X
X	O	X

Leaf

O	O	
O		X
X	O	X

Not-leaf (still ends in O winning)

b.)

O	O	X
	X	
X	O	X

Leaf

O	O	
X	X	
X	O	X

Not-leaf

O	O	
	X	X
X	O	X

Not-leaf

Homework

10.7 + 10.8

2.) a.) 1110011111

b.) 1100011011110111111

c.) den

d.) dance

10.8

1.) a.)  Does not exist since degree only = 11.

b.) 

c.) 

d.) Not possible. Seven vertices = at least seven edges.

e.) Not ~~poss~~ possible. The tree must have leaves and leaves have degree 1.

2.) a.) must be n-1, since it could be all leaves except the root.

b.) 

All vertices except the root are leaves.

Homework

10.8 + 10.9

5.) a.) If $m < n-1$, then say $n = 5$, this means m is at most 3. This shows

We can't connect all vertices which means it is not connected.

10.9

1.) a.) {(f, i, h, e, b, g, c, a, d)}

b.) {(d, f, b, i, h, e, a, c, g)}