10.2.1

There are 6 vertices and 6 edges.

v	deg(v)	Isolated?	Pendant?
a	2		
b	4		
c	1		Y
d	0	Y	
e	2		
f	3		

10.2.3

There are 9 vertices and 12 edges.

v	deg(v)	Isolated?	Pendant?
a	3		
b	2		
c	4		
d	0	Y	
e	6		
f	0	Y	
g	4		
h	2		
i	3		

10.2.9

The are 5 vertices and 13 edges.

v	$\deg^-(v)$	$\deg^+(v)$
a	6	1
b	1	5
c	2	5
d	4	2
e	0	0

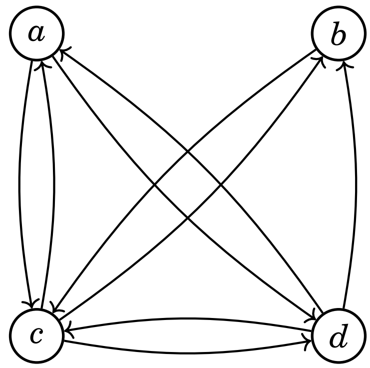
10.2.21

It is bipartite since you can assign say blue to e and red to the rest of the vertices and there will be no adjacent colorings.

10.3.3

v	$N(v)$
a	$\{a, b, c, d\}$
b	$\{d\}$
c	$\{a, b\}$
d	$\{b, c, d\}$

10.3.11



10.4.1

a) Path of length 4 that isnt a circuit or simple

b) Not a path

c) Not a path

d) Path of length 5 that is a circuit

10.4.3

Not connected

10.4.5

Not connected

10.5.1

No euler path or circuit exists

10.5.3

No euler circuit exists, but there is an euler path $a \to e \to c \to e \to b \to e \to d \to b \to a \to c \to d$

10.5.5

$a \to b \to c \to d \to c \to e \to d \to b \to e \to a \to e \to a$

10.6.3

The path $a \to c \to d \to e \to g \to z$ is a shortest path of length 16.

11.1.1

a, c and e are trees.

11.1.3

a) a

b) $a, b, c, d, f, h, j, q, t$

c) $e, l, m, n, g, o, p, i, s, u, r, k$

d) q, r

e) c

f) p

g) f, b, a

h) e, f, l, m, n

11.1.7

Level	$L(V)$
0	a
1	b, c, d
2	e, f, g, h, i, j, k
3	l, m, n, o, p, q, r
4	s, t
5	u

11.1.17

A tree with n vertices has $n-1$ edges, hence there are 9999 edges.

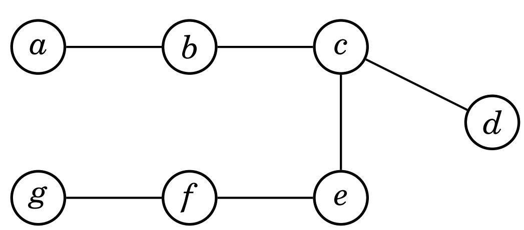
11.4.1

Since a spanning tree must include all n vertices, and therefore the spanning tree must have $n-1$ edges, the question is the same as finding M such that

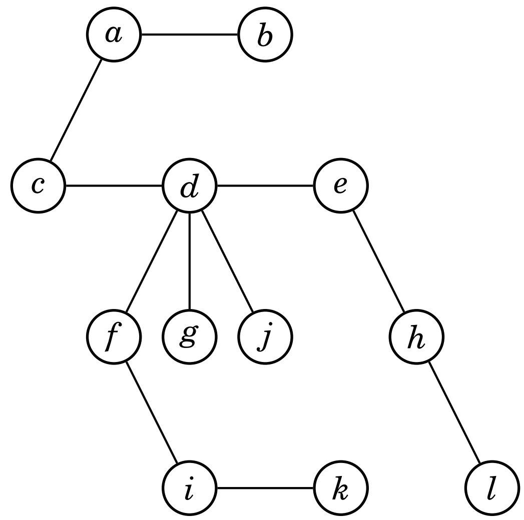
$$m - M = n - 1 \implies M = m - n + 1.$$

Therefore $m - n + 1$ edges must be removed.

11.4.3



11.4.5



11.5.1

Deep Springs-Oasis, Oasis-Dyer, Oasis-Silver Peak, Silver Peak-Goldfield, Lida-Gold Point, Gold Point-Beatty, Lida-Goldeld, Goldfield-Tonopah, Tonopah-Manhattan, Tonopah-Warm Springs

12.1.5

a)

x	y	z	$F(x,y,z)$
0	0	0	0
1	0	0	0
1	1	0	0
1	0	1	0
0	1	0	1
0	1	1	1
0	0	1	0
1	1	1	0

b)

x	y	z	$F(x,y,z)$
0	0	0	0
1	0	0	1
1	1	0	1
1	0	1	1
0	1	0	0
0	1	1	1
0	0	1	0
1	1	1	1

c)

x	y	z	$F(x,y,z)$
0	0	0	1
1	0	0	1
1	1	0	1
1	0	1	1
0	1	0	1
0	1	1	1
0	0	1	1
1	1	1	0

d)

x	y	z	$F(x,y,z)$
0	0	0	0
1	0	0	1
1	1	0	0
1	0	1	0
0	1	0	0
0	1	1	0
0	0	1	0
1	1	1	1

12.1.15

x	$x+x$	$x \cdot x$
0	0	0
1	1	1

.

12.1.23

x	$\overline{x}$	$x\overline{x}$
0	1	0
1	0	0

.

12.2.1

a) $\overline{x}\,\overline{y}z$ b) $\overline{x}y\overline{z}$ c) $\overline{x}yz$ d) $\overline{x}\,\overline{y}\,\overline{z}$

12.2.3

a) $F(x,y,z) = xyz + \overline{x}yz + x\overline{y}z + xy\overline{z} + \overline{x}\,\overline{y}z + x\overline{y}\,\overline{z} + \overline{x}y\overline{z}$

b) $F(x,y,z) = xyz + xy\overline{z} + \overline{x}yz$

c) $F(x,y,z) = xyz + x\overline{y}z + xy\overline{z} + x\overline{y}\,\overline{z}$

d) $F(x,y,z) = x\overline{y}z + x\overline{y}\,\overline{z}$

12.2.5

$$F(x,y,z,w) = x\overline{y}\,\overline{z}\,\overline{w} + \overline{x}y\overline{z}\,\overline{w} + \overline{x}\,\overline{y}z\overline{w} + \overline{x}\,\overline{y}\,\overline{z}w + xyz\overline{w} + \overline{x}yzw + xy\overline{z}w + x\overline{y}zw$$

12.3.5

$$(x+y+z) + (\overline{x}+y+z) + (\overline{x}+\overline{y}+\overline{z}).$$