Section 8.2

4)d) An = 2An-1 - An-2 for n >= 2 A0=4 A1=1

r^n = 2r^(n-1) - r^(n-2) divide r^(n-2) across each term.

r^2 = 2r - 1

r^2 - 2r + 1 r = 1,1

An = a1(1)^n + a2n(1)^n

A0 = a1 = 4

A1 = a1 + a2 = 1

A1 = 4, A2 = -3

An = 4(1)^n -3n(1)^n

4)e) An = An-2 for n>=2, A0 = 5, A1 = -1

r^n = r^(n-2) divide r^n-2 across each term.

r^2 = 1

r^2 - 1 = 0

R = 1,-1

An = a1(1)^n + a2(-1)^n

5 = a1 + a2

-1 = a1 - a2

A1 = 2 A2 = 3

An = 2(1)^n + 3(-1)^n

4)g)

An+2 = -4An+1 + 5An n>=0 A0 = 2, A1=8

r^2 = -4r + 5

r^2 + 4r - 5 = 0

R = 1,-5

An = a1(1)^n + a2(-5)^n

2 = a1 + a2

8 = a1 - 5a2

A1 = 3, A2 = -1

An = 3(1)^n - (-5)^n

8)

An = .5(An-1) + .5(An-2)

r^n = .5(r^n-1) + .5(r^n-2) divide r^n-2 across each term

r^2 = .5r + .5

r^2 - .5r -.5 = 0

R = 1,-.5

An = a1(1)^n + a2(-.5)^n

A1 = 100,000 A2 = 300,000

100,000 = a1 - .5a2

300,000 = a1 + .25a2

A1 = (800000/3) A2 = (700000/3)

An = (800000/3)(1)^n + (700000/3)(-.5)^n

12)

An = 2An-1 + An-2 - 2An-3 A0=3 A1=6 A2=0

r^n = 2r^(n-1) + r^(n-2) - 2r^(n-3) divide r^(n-3) across

r^3 = 2r^2 + r - 2

r^3 - 2r^2 - r + 2 = 0;

R = 2,-1,1

An = a1(2)^n + a2(-1)^n + a3(1)^n

3 = a1 + a2 + a3

6 = 2a1 - a2 + a3

0 = 4a1 + a2 + a3

A1 = -1, A2 = -2, A3 = 6

An = -(2)^n - 2(-1)^n + 6(1)^n

14)

An = 5An-2 - 4An-4 A0=3, A1=2, A2=6, A3=8

r^n = 5r^(n-2) - 4r^(n-4) divide r^(n-4) across each term.

r^4 = 5r^2 - 4

r^4 - 5r^2 + 4 = 0

R = 1,-1,2,-2

An = a1(1)^n + a2(-1)^n + a3(2)^n + a4(-2)^n

3 = a1+a2+a3+a4

2 = a1 - a2 + 2a3 - 2a4

6 = a1 + a2 + 4a3 + 4a4

8 = a1 - a2 + 8a3 +A 8a4

Aumented matrix to solve

A1=1 A2=1 A3=1 A4=0

An = (1)^n + (-1)^n + (2)^n

24)

An = 2An-1 + 2^n

An = 2(n-1)2^(n-1) + 2^n

An = (n-1)2^n + 2^n

An = n2^n - n^2 + 2^n

An = n2^2

Repeated roots, R = 2,2;

An = a1(2)^n + n(2)^n

A0 = 2

2 = a1

An = 2(2)^n + n(2)^n

6)a)

x+y=0

x+x=0 not reflexive

X+y = 0 = y+x is symmetric

-1 != 1 not antisymmetric

1+1 != 0 not transitive.

c)

X-y is a rational number

X-x = rational number, is reflexive

X-y, y-x is rational, is symmetric.

X-y, y-x, y!=x, not antisymmetric

X-y+y-z = x-z, is transitive

d)

X = 2y

1= 2 not reflexive.

X = 2y y = .5x not symmetric.

x=2y y=2x x = 4x is antisymmetric.

X = 2y and y = 2z but x!=2z not transitive

e)

xy>=0

x^2 >= 0 is transitive

xy>=0 yx>=0 is symmetric

Xy >=0 yx>=, x!=y, not antisymmetric.

-1\*1<0 not transitive.