$a_n = 2 \cdot 3^n$ $3a_{n-1}$
$3(3a_{n-2})$

$a_n = 2n + 3$

Assignment 10

7.1

4 a) $-1, 2, -4, 8, -16, 32$

b) $2, -1, -3, -2, 1, 3$

c) $1, 3, 27, 2187, 14348907, 6.176733963 \times 10^{14}$

d) $-1, 0, 1, 1, 2, 3$

e) $1, 1, 2, 2, 1, 1$

4 a) $-3 \cdot 0 + 4 \cdot 0 = 0$

b) $-3 \cdot 1 + 4 \cdot 1 = 1$

c) $-3 \cdot (-4)^{n-1} + 4(-4)^{n-2}$

$-3 \cdot (-4)^{n-1} - (-4) \cdot (-4)^{n-2}$

$(-3-1) \cdot (-4)^{n-1}$

$(-4)^n$

d) $-3 \cdot (2(-4)^{n-1} + 3) + 4(2(-4)^{n-2} + 3)$

$-2 \cdot 3(-4)^{n-1} - 2(-4)(-4)^{n-2} + 3$

$2(-4)^n + 3$

8 a) $-(a_n - 1)$

$-1 \cdot (-a_n - 2)$

$\boxed{a_n = 5 \cdot -1^n}$

b) $a_{n-1} + 3$

$a_{n-2} + 2(3)$

$\boxed{a_n = 1 + 3n}$

c) $a_{n-1} - n$

$a_{n-2} - n - 1$

$\boxed{a_n = \frac{1}{2}(n^2 + n + 8)}$

d) $2a_{n-1} - 3$

$2(2a_{n-2} - 3) - 3$

$2^2(2a_{n-3} \cdot 3) - (3^2)$

$\boxed{a_n = 3 - 2^{n+2}}$

→

e) $a_n = 2(n+1)n!$ f) $a_n = 3 \cdot 2^n \cdot n!$

g) $a_n = \frac{1}{4}(2n + 29(-1)^n - 1)$

14) a) $a_n = a_{n-1} + 0.05(a_{n-1}) + 1000$, $a_0 = 50,000$

$\boxed{a_n = 1.05(a_{n-1}) + 1000}$

b) $\boxed{83,421.9}$

c) $a_n = 10,000\left(\left(\frac{3}{20}\right)^n \cdot 7^{n+1} - 2\right)$

18) a) $P(n) = n \cdot P(n-1)$, $P_1 = 1$

b) $P(n) = n(n-1)(n-2)(n-3)\ldots$

$\boxed{P(n) = n!}$

7.2

2) a) Degree 2 b) No c) No d) No

e) No f) No g) Degree 7

12) $x^3 - 2x^2 - x + 2 = 0$

$x^2(x-2) - (x-2) = 0$

$(x-2)(x^2-1) = 0$

$x_1 = 2, x_2 = -1, x_3 = 1$

$a_n = \alpha_1 2^n + \alpha_2 (-1)^n + \alpha_3$

$\alpha_1 = \frac{1}{6}, \alpha_2 = -2, \alpha_3 = 6$

$\boxed{a_n = -2^n - 2(-1)^n + 6}$

14) $x^4 - 5x^2 + 4 = 0$

$x_1 = -1,\ x_2 = 1,\ x_3 = -2,\ x_4 = 2$

$a_n = \alpha_1(-1)^n + \alpha_2 + \alpha_3(-2)^n + \alpha_4 2^n$

$\alpha_1 = 1,\ \alpha_2 = 1,\ \alpha_3 = 0,\ \alpha_4 = 1$

20)