Review #2

1a) Explicit

$a_1 = 3(1)+2 = 5$

$a_2 = 3(2)+2 = 8$

$a_3 = 3(3)+2 = 11$

$a_4 = 3(4)+2 = 14$

b.) Recursive

$a_1 = 4$

$a_2 = a_1 + 7 = 4+7 = 11$

$a_3 = a_2 + 7 = 11+7 = 18$

$a_4 = a_3 + 7 = 18+7 = 25$

2a.) $(1^2+2) + (2^2+2) + (3^2+2) + (4^2+2) + (5^2+2)$

$3 + 6 + 11 + 18 + 27$

65

b) $(4-4) + (4-5) + (4-6) + (4-7) + (4-8) + (4-9)$

$0 + -1 + -2 + -3 + -4 + -5$

-15

3a.) $a_n = 25 + (n-1)(2)$

$a_{12} = 25 + (12-1)(2) = 47$

b.) First 12 rows $\frac{12(25+47)}{2} = 432$

Rows 13–19 $7(47) = 329$ so $432+282 = 761$

4a.) arithmetic $a_n = -16 + (n-1)(12)$

$= -16 + 12n - 12$

$a_n = 12n - 28$

$a_{24} = 12(24) - 28 = 260$

b.) geometric $a_n = \frac{1}{12}(-6)^{n-1}$

$a_8 = \frac{1}{12}(-6)^{8-1} = \frac{1}{12}(-6)^7 = -23,328$

5.) a) arithmetic $a_n = 300 + (n-1)(200)$

$a_n = 200n + 100$

b.) First way: Add up penalties till you get a sum of 4800

$300 + 500 + 700 + 900 + 1100 + 1300 \rightarrow$ 6 days

800 1500 2400 3500 4800

second way: use sum formula for arithmetic and solve for n

$4800 = \frac{n(300 + a_n)}{2}$ $\rightarrow a_n = 200n + 100$

$4800 = \frac{n(300 + 200n + 100)}{2}$

$9600 = n(200n + 400)$

$9600 = 200n^2 + 400n$

A quadratic!!

$\rightarrow 200n^2 + 400n - 9600 = 0$

$n^2 + 2n - 48 = 0$

$(n+8)(n-6) = 0$

$\cancel{-8}$ $\boxed{6}$

6.) (12, 17) (6, 71)

$m = \frac{71-17}{6-12} = \frac{54}{-6} = -9$

$y - 17 = -9(x-12)$

$y - 17 = -9x + 108$

$y = -9x + 125$

Recursive

$a_1 = -9(1) + 125 = 116$

$a_1 = 116$

$a_n = a_{n-1} - 9$

$a_n = -9n + 125$

7.) a.) $S_n = \frac{n(4+53)}{2}$

$\frac{8(4+53)}{2}$

228

$53 = 4 + (n-1)(7)$

$53 = 4 + 7n - 7$

$53 = 7n - 3$

$56 = 7n$

$8 = n$

b.) use calculator 4810

c.) $S_n = \frac{20\left(1 - \left(-\frac{1}{2}\right)^9\right)}{1 - -\frac{1}{2}}$

$= \frac{20\left(\frac{513}{512}\right)}{3/2} = \frac{855}{64} = 13.3594$

8.) a) $1 \cdot r^3 = 125$

$r^3 = 125$

$r = 5$

1, 5, 25, 125

b.) $3 + 3d = 1.5$

$3d = -1.5$

$d = -.5$

3, 2.5, 2, 1.5

9.) $6 \cdot r^4 = 486$

$r^4 = 81$

$r = 3$

$a_1 = 2$

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

recursive: $a_1 = 2$

$a_n = 3(a_{n-1})$