College Algebra 9.1-9.3 Final Exam Review   Name_____

$$a_n = a_1 \cdot r^{n-1} \qquad a_n = a_1 + d(n-1)$$

$$S_n = \frac{n}{2}(a_1 + a_n) \qquad S_n = \frac{a_1(1-r^n)}{1-r}$$

1. Write the first 5 terms of each sequence whose general term is given :
(assume n begins with 1)

a) $a_n = 3n - 1$

b) $a_n = \dfrac{n!}{n+1}$

c) $a_n = \dfrac{2n-1}{n+3}$

2. Write the first 5 terms of each recursive sequence whose general term is given :
(assume n begins with 1)

a) $a_1 = 5,\ a_{k+1} = a_k + 3$

b) $a_1 = 3,\ a_{k+1} = 2a_k + 1$

c) $a_1 = 10,\ a_{k+1} = 2(a_k - 3)$

3. Calculate each sum:

a) $\displaystyle\sum_{i=3}^{7} 3i$

b) $\displaystyle\sum_{i=1}^{5} (2i)^2 + 1$

c) $\displaystyle\sum_{i=1}^{5} 3i^2 - 10$

4. Express the sum using summation notation. Use 1 for the lower limit of summation and use *i* for the index of summation

a) $\dfrac{1}{3} + \dfrac{2}{4} + \dfrac{3}{5} + \ldots + \dfrac{10}{12}$

b) $\dfrac{1^2 + 3}{5} + \dfrac{2^2 + 3}{5} + \dfrac{3^2 + 3}{5} + \ldots + \dfrac{11^2 + 3}{5}$

c) $\dfrac{4}{3+1} + \dfrac{4}{3+2} + \dfrac{4}{3+3} + \ldots + \dfrac{4}{3+20}$

5. Write the first five terms of each arithmetic sequence.

a) $a_1 = 2,\ d = 7$

b) $a_1 = 38,\ d = -3$

c) $a_1 = 5,\ d = 3$

6. Find the indicated term of each arithmetic sequence.

a) Find a_{18} when a_1 = 5 and d = 3.

b) Find a_{21} when a_1 = 7 and d =-3.

c) Find a_{30} when a_1 = 14 and d = 7.

d) Find a_{25} when a_1 = 45 and d = -4.

7. Write a formula for the nth term of each of the following arithmetic sequences. Do not use a recursion formula.

a) $3, 7, 11, 15, \ldots$

b) $5, 11, 17, 23, \ldots$

c) $8, 13, 18, 23, \ldots$

8. Find the following sums:
a) Find the sum of the first 50 terms of the following arithmetic sequence having a_1 =12 and d = 3

b) Find the sum of the first 30 terms of the following arithmetic sequence: 28, 26, 24, 22, 20,...

c) Find the sum of the first 45 terms of the following arithmetic sequence: 12, 15, 18, 21, 24,...

9. A theater has 30 seats in the first row and 50 rows in all. Each successive row contains two additional seats. How many seats are in the theater?

10. A brick staircase has a total of 15 steps. The bottom step requires 108 bricks. Each successive step requires 5 fewer bricks than the prior one. How many bricks are required to build the staircase?

A1