Sequences & Series **Name:**_____
Precalculus

Arithmetic Sequences

1. Define an arithmetic sequence and given an example.

2. For each of the sequences below, determine the common difference, the explicit formula, and the 63rd term in the sequence.

a. $3, 11, 19, 27, \ldots$

b. $26, 21, 16, 11, \ldots$

c. $\frac{3}{4}, \frac{5}{4}, \frac{7}{4}, \frac{9}{4}, \ldots$

3. For each sequence below, two terms are given. Determine the common difference and explicit formula for each sequence.

a. $a_{16} = -68, a_{35} = -182$

b. $a_{10} = 54, a_{33} = 123$

Geometric Sequences

4. Define a geometric sequence and given an example.

5. For each of the sequences below, determine the common ratio, the explicit formula, and the 63rd term in the sequence.

a. $1, -3, 9, -27, \ldots$

b. $20,\ 5,\ \frac{5}{4},\ \frac{5}{8},\ \ldots$

Sigma Notation

6. Find the following sums by hand (there are formulas, but I am simply looking for you to understand what this notation is asking you to find).

$$\sum_{m=7}^{11} 4m - 3$$

$$\sum_{n=1}^{5} \frac{4^n}{3}$$

Recursive Formulas

7. If $a_{13} = 11$ and $a_n = a_{n-1} + 5$, find a_{17}. Show all relevant work.

8. If $a_3 = 5$ and $a_n = -3(a_{n-1})$, find a_9. Show all relevant work.

9. If $a_1 = -2$ and $a_n = n + 3a_{n-1}$, find the sum of the first five terms (S_5).