

Reflective Portfolio  
Unit #4: Sequences and Series

**DIRECTIONS:** Print and complete! Hand it in inside your 2 pocket folder along with Units #1, #2, & #3!!

Section #1: Vocabulary (words and/or diagrams)

Define each:

- Sequence - \_\_\_\_\_
- Two major types of explicit sequences
  - Arithmetic - \_\_\_\_\_
    - Equation Type is \_\_\_\_\_
  - Geometric - \_\_\_\_\_
    - Equation Type is \_\_\_\_\_
- Recursive Sequence - \_\_\_\_\_
- Series- \_\_\_\_\_
- Sigma notation - \_\_\_\_\_

Section #2: Formulas/Equations/Rules

- Arithmetic Sequence:  $a_n =$  \_\_\_\_\_ where  $a_1 =$  \_\_\_\_\_,  
 $d =$  \_\_\_\_\_, and  $n =$  \_\_\_\_\_
  - **Example #1:** Find the 10<sup>th</sup> term in the following sequence: { 2, 6, 10, 14, 18, ... }
  
- Geometric Sequence:  $a_n =$  \_\_\_\_\_ where  $a_1 =$  \_\_\_\_\_,  
 $r =$  \_\_\_\_\_, and  $n =$  \_\_\_\_\_
  - **Example #2:** Find the 10<sup>th</sup> term in the following sequence: { 2, 6, 18, 54, 162, ... }
  
- Sum of a finite arithmetic series:  $S_n =$  \_\_\_\_\_ where  $a_1 =$  \_\_\_\_\_,  
 $a_n =$  \_\_\_\_\_, and  $n =$  \_\_\_\_\_

- **Example #3A:** Determine the sum of the all of the even integers from 2 to 2000.

- **Example #3B:** Evaluate  $\sum_{n=1}^{20} (3n - 7)$ .

**Steps**

- $a_1 =$  \_\_\_\_\_  $a_{20} =$  \_\_\_\_\_

- Use the Arithmetic Series formula:

- $S_{20} =$  \_\_\_\_\_

- **Sum of a finite geometric series:**  $S_n =$  \_\_\_\_\_ where  $a_1 =$  \_\_\_\_\_,  
 $r =$  \_\_\_\_\_, and  $n =$  \_\_\_\_\_

- **Example #4:**  $\sum_{n=1}^{12} 4 \cdot 3^{n-1}$  (Show work using geometric series formula from reference sheet)

- $a_1 =$  \_\_\_\_\_  $r =$  \_\_\_\_\_

- $S_{12} =$  \_\_\_\_\_

- **Example #5:** 1, 2, 4, 8, ... n=30

### Section #3: Key methods and concepts (complete these examples)

- How to show work and calculate the sum using sigma notation

- Example #6:

$$\sum_{n=1}^3 (2n - nx)$$

- How to find the common difference

- Example #7A: If  $a_1 = -6$  and  $a_5 = 26$  find the common difference

- Example #7B: If  $x + 4$ ,  $2x + 5$ , and  $4x + 3$  represent the first three terms of an arithmetic sequence, then find the value of  $x$ .

What is the fourth term?

- How to find the common ratio

- Example #8: If  $a_1 = 2$  and  $a_5 = 162$  find the positive common ratio

- Recursive sequence:

- Example #9: Find the first 5 terms:  $a_1 = 6$  and  $a_{n+1} = 2a_n + 3$

Answers: 1) 38 2) 39366 3A) 1001000 3B) 490 4) 1062880 5) 1073741823 6)  $12 - 6x$  7A) 8 7B)  $x=3, 19$   
8) 3 9) 6, 15, 33, 69, 141