

## 6.E Series

Date \_\_\_\_\_

Some Vocabulary:

Series –

Finite Series –

Infinite Series -

$n^{\text{th}}$  Partial Sum –

### Sigma Notation

The symbol \_\_\_\_\_ is the \_\_\_\_\_

\_\_\_\_\_ is called the \_\_\_\_\_

Read this as “ \_\_\_\_\_ ”

Example: Write out the expression for the series below:

$$\sum_{i=1}^3 (2i + 3) =$$

### Two Basic Properties of Finite Series

$$\sum_{k=1}^n (a_k + b_k) =$$

If  $c$  is a constant,  $\sum_{k=1}^n ca_k =$

and  $\sum_{k=1}^n c =$

Problems:

1) Consider the sequence  $\{u_n\} = \{n^2\}$ .

- a. Write out the first 5 terms of this sequence.
- b. Determine the partial sums  $S_n$  for  $n = 1, 2, 3, 4, 5$
- c. Write a general expression for the  $n$ th partial sum  $S_n$  using Sigma notation.

2) For each of the following sequences, write an expression for  $S_n$ , and determine  $S_5$ .

a. 3, 11, 19, 27, ...       $S_n =$        $S_5 =$

b. 12, 6, 3, 1.5, ...       $S_n =$        $S_5 =$

3) Expand and evaluate each of the following:

a.  $\sum_{k=1}^3 4k =$

b.  $\sum_{k=1}^5 k(k+1) =$

4) Take the Arithmetic sequence: 4, 7, 10, 13, ....

- a. The common difference  $d =$  \_\_\_\_\_
- b. An expression for the  $n$ th term of this sequence is:  $u_n =$  \_\_\_\_\_
- c. Determine the first few  $n$ -th partial sums,  $S_n$ , for  $n = 1, 2, 3, 4, 5$
- d. Write out the 10-th partial sum as a string of summation:  $4 + 7 + 10 + \dots$  AND directly below it write the same summation BUT in reverse. Then add up these two rows of numbers by adding vertically first and then summing the resulting row. What is this total AND what does it represent? What do you notice about the pieces?