

Sequences

1. Write the next three terms of each sequence:

- a. 1, 5, 9, 13, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
- b. 2, 6, 12, 20, 30, 42, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
- c. 1, -1, 1, -1, 1, -1, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

2. Write the first three terms of the sequences defined by the given formulas:

- a.  $a_n = n(n + 1)$  \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
- b.  $b_n = (-1)^{n+1}(\frac{1}{2})^n$  \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
- c.  $c_n = 3n - 1$  \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

3. Write explicit formulas for the sequences of exercise 1.

- a.  $d_n =$  \_\_\_\_\_
- b.  $e_n =$  \_\_\_\_\_
- c.  $f_n =$  \_\_\_\_\_

Summation Notation:  $\sum_{i=1}^n a_i = a_1 + a_2 + \dots + a_n$

4. Write out each expression without summation notation.

a.  $\sum_{i=1}^4 3i^2$

b.  $\sum_{j=2}^4 (-1)^j (\frac{j}{j+3})$

c.  $\sum_{k=0}^5 (2k+1)$

Product Notation:  $\prod_{k=1}^n a_k = a_1 \cdot a_2 \cdot \dots \cdot a_n$

Factorial Notation:  $\prod_{k=1}^n k = 1 \cdot 2 \cdot \dots \cdot n = n!$  and  $0! = 1$ .

Example:  $\prod_{k=1}^5 k = 5! = (1)(2)(3)(4)(5) = 120$