

**11.1 Mathematical Patterns**  
**Algebra 2B**

Name \_\_\_\_\_

Date \_\_\_\_\_ Per \_\_\_\_\_

**Arithmetic:** the **difference** between consecutive terms is constant (common difference  $d$ ).

**Geometric:** the **ratio** between consecutive terms is constant (common ratio  $r$ ).

**Recursive Formula:** defines the terms in a sequence by relating each term to the term before it.

For example: **Arithmetic:**  $a_n = a_{n-1} + d$

**Geometric:**  $a_n = a_{n-1} \cdot r$

→To find a specific term given the recursive formula, you must be given the previous term.

**Explicit Formula:** defines the  $n$ th term in terms of  $n$ .

For example: **Arithmetic:**  $a_n = a_1 + (n-1)d$

**Geometric:**  $a_n = a_1 \cdot r^{n-1}$

**Ex. #1** Find the first 5 term of the sequence (recursive):

a)  $a_n = a_{n-1} - 6; a_1 = 12$

b)  $a_n = \frac{1}{3} a_{n-1}; a_1 = 12$

**Ex. #2** Find the first 5 terms of the sequence (explicit):

a)  $a_n = 3n - 1$

b)  $a_n = n(n-1)$