



# 6-4 Mathematical Literacy and Vocabulary

## Geometric Sequences

Label the parts of the geometric sequence formulas. Some parts are already done

**Explicit formula**

**Recursive formula**

Initial condition:  $a_1 =$  first term

$$a_n = a_1(r)^{n-1}$$

$$a_n = r \cdot a_{(n-1)}$$

first term

previous term

common

term you're finding

common ratio

$a_{20}$

20<sup>th</sup> term

term you are trying to find

Use the list to complete the diagram.

$$a_n = a_{n-1} \cdot r, n \geq 2$$

$$r \text{ in } a_n = a_{n-1} \cdot r, n \geq 2$$

a sequence in which the ratio of any term to its preceding term is constant

explicit formula for a geometric sequence

a sequence in which the difference between every pair of consecutive terms is the same

$$a_1 \text{ in } a_n = a_1 \cdot r^{n-1}, n \geq 1$$

$$a_n = a_1 \cdot r^{n-1} \text{ for } n \geq 1$$

arithmetic sequence

geometric sequence

recursive formula for a geometric sequence

common ratio

initial value



# 6-4 Additional Practice

## Geometric Sequences

Is the sequence a geometric sequence? If it is, give the common ratio.

1. 1, 49, 98, 147, ...

2. 4, 12, 36, 108, ...

3. 16, 12, 9,  $\frac{27}{4}$ , ...

$r = \frac{49}{1}$

$r = \frac{12}{4} = 3$

$r = \frac{12}{16} = \frac{3}{4}$

Write a recursive formula and an explicit formula for each geometric sequence.

4. 9, 18, 36, 72, ...

5. 540, 180, 60, 20, ...

$a_n = a_{n-1}(r)$   
 $a_1 = \underline{\quad}$

Recursive:

Recursive:

Explicit:

Explicit:

$a_n = a_1(r)^{n-1}$

Write a recursive formula for each explicit formula.

6.  $a_n = -4 \cdot 3^{n-1}$

7.  $a_n = 5 \cdot \left(\frac{2}{3}\right)^{n-1}$

$a_1 = -4$   
 $r = 3$

$a_n = a_{n-1}(3)$   
 $a_1 = -4$

Write an explicit formula for each recursive formula by first completing the table.

8.  $a_1 = 50$   
 $a_n = 0.5a_{n-1}$

9.  $a_1 = 2$   
 $a_n = 6a_{n-1}$

n	$a_n$
1	50
2	25
3	12.5
4	6.25

$\left. \begin{array}{l} 50 \\ 25 \\ 12.5 \\ 6.25 \end{array} \right\} \cdot 0.5$

Explicit Formula:  
 $a_n = 50(0.5)^{n-1}$

n	$a_n$
1	
2	
3	
4	

Explicit Formula:

11. The number of subscribers for an online periodical doubles each month. The first month of publication, there were only 100 subscribers. How many subscribers will there be in one year?