

Consider the sequence 3, 6, 12, 24, What pattern do you notice in the sequence?

Handwritten: $3 \times 2 = 6$, $6 \times 2 = 12$, $12 \times 2 = 24$
 Multiplying by 2

This is an example of a **geometric sequence**.

- Each term in the sequence is the multiple of the previous term and some real number r .

Consider the sequence -2, 4, -8, 16,

- a. Write a recursive formula for the sequence.

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

- b. Write an explicit formula for the sequence.

$$a_n = -2(-2)^{n-1}$$

- c. Find the 12th term of the sequence.

$$a_{12} = -2(-2)^{12-1}$$

$$a_{12} = -2(-2)^{11} = 4096$$

Formulas for Geometric Sequences

Recursive Formula

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

the NEXT NUMBER equals the PREVIOUS NUMBER times the RATIO

Explicit Formula

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

the n^{th} NUMBER equals the FIRST NUMBER times the RATIO to the $n-1$

The first four terms of a geometric sequence are 7, 14, 28, and 56.

- a. Write a recursive formula for the sequence.

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

- b. Write an explicit formula for the sequence.

$$a_n = 7(2)^{n-1}$$

- c. Find the 20th term of the sequence.

$$a_{20} = 7(2)^{19} = 3670016$$

Geometric Sequence Graph

An art gallery was showcasing a 6-inch long photo of a geometric landscape. The picture was enlarged ten times, each time by 125% of the previous picture.

Enter formulas that will give the length of each enlarged print.

$a_1 =$

Recursive formula:

$a_n =$

$a_{10} = 6(1.25)^9$

Explicit formula:

$a_n =$

Sketch the graph of the geometric sequence found in the table.

Term Number	Term
1	3
2	6
3	12
4	24
5	48
6	96

