

ASSIGNMENTS: Geometric Sequences

DIRECTIONS: Geometric Sequences involve a set of numbers where multiplication is necessary to get to the next term (Arithmetic Sequences required addition or subtraction). For example:

4, 8, 16, 32, 64, ... what's the 9th term?
 3 9 27 81

We see in this Geometric Sequence, the common ratio that multiplies each number to get to the next term is " $\frac{2}{3}$ "

The n^{th} term of a
 geometric sequence

$$u_n = u_1 r^{n-1}$$

In our example above, we would input "9" as "n" and " $\frac{2}{3}$ " as "r" and "4" as " a_1 "

Thus, the 13th term = $4 \cdot (\frac{2}{3})^8 = \frac{1024}{6561}$

- 1.) Consider the infinite geometric sequence 25, 5, 1, 0.2, ...
- (a) Find the common ratio.
- (b) Find
- (i) the 10th term;
- (ii) an expression for the n th term.

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2.) $-11, 22, -44, 88, \dots$ Find the 17th term

3.) $6, -3, \frac{3}{2}, \frac{-3}{4}, \dots$ Find the 11th term

17th term = _____

11th term = _____

4.) Is the following sequence **GEOMETRIC** or **ARITHMETIC** (circle one)?

$-447, -440, -433, -426, -419, \dots$

Please explain: _____

5.) If the 8th term of a geometric sequence is -384 and the first term is 3 , find the common ratio.

6.) Find the 13th term
 $0.5, 3.5, 24.5, 171.5, \dots$

Common ratio = _____

13th term = _____

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Answers (show your work!)

1.) a: $1/5$; b: 1.28×10^{-5}

2.) $-720,896$

3.) $3/512$

4.) Arithmetic

5.) -2

6.) $6,920,643,601$