

Sequences and Series – Geometric Sequences

Specific Sequence # 2 – Geometric Sequence

Before Getting Started – The following are examples of geometric sequences:

1.) 12 , 96 , 768 , 6144 , _____ , _____ Pattern Rule: _____

2.) $\frac{1}{2}, -\frac{1}{4}, \frac{1}{8}, -\frac{1}{16}, \dots$ Pattern Rule: _____

What do you think happens in geometric sequences? _____

- **geometric sequence** → a sequence where the _____ between _____ terms is a constant, called _____, the _____

Example 1: Determine if these sequences are geometric. If so, state the common ratio.

a.) 3 , 9 , 27 , 81 , b.) 8 , 14 , 24.5 , 36.75 , ... c.) 96 , - 24 , 6 , $-\frac{3}{2}$

Example 2: Find the next three terms of each geometric sequence. Write your answer as sequence.

a.) $a_1 = 4$ and $r = -5$ b.) 1134 , 378 , 126 , ...

“Nth Term Formula” of Geometric Sequence: Used to find ANY term of a geometric sequence

Consider a geometric sequence whose first term is _____ and whose common ratio is _____:

a_1	→	1st term (a_1)
_____	→	2nd term ($a_2 =$ _____)
_____ = _____	→	3rd term ($a_3 =$ _____)
_____ = _____	→	4th term ($a_4 =$ _____)
_____ = _____	→	5th term ($a_5 =$ _____)

(General) nth term Formula: _____ → some important notes about this formula...

- formula will always be an _____
- do not multiply _____ and _____ together to simplify the formula
- put _____ around any “r” that’s a _____ or _____

Example 3: Find what is indicated for each geometric sequence.

a.) $a_1 = 2$ and $r = 4$, find the 8^{th} term	b.) Find a_5 for the sequence $-1, \frac{1}{4}, -\frac{1}{16}, \dots$	c.) Write the n th term formula (equation) for the sequence $3, -36, 432, \dots$
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Example 4: Considering all given sequences are geometric – Find what is asked.

a.) The 7^{th} term of the sequence is 470596 and the common ratio is 7. What is the first term?	b.) The sixth term of the sequence is -6250 and the first term is -2 . What is the common ratio?
c.) The third term is 20 and the fifth term is five. What is ninth term?	d.) Which term is 78,732 in the sequence of $4, 12, 36, 108, \dots$?

- **geometric means** → represent the _____ of a geometric sequence

Ex: Circle the 3 geometric means between 2 and 162: $2, 6, 18, 54, 162, \dots$

Example 5: Find the geometric means of the geometric sequence below.

$2.25, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, 576$