Algebra 1 7.7

Identify and generate geometric sequences

Relate geometric sequences to exponential functions

sequence

arithmetic sequence (3.5) +

geometric sequence X

common ratio r

whiteboards

Quiz 7.5-7.6

KeyConcept *n*th term of a Geometric Sequence

The nth term a_n of a geometric sequence with first term a_1 and common ratio r is given by the following formula, where n is any positive integer and $a_1, r \neq 0$.

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

(first)(1 less r)

Example 3 Find the *n*th Term of a Geometric Sequence

a. Write an equation for the *n*th term of the sequence $-6, 12, -24, 48, \ldots$.

-6(?)=12

find a_1
find r
answer the question

$r = -2$

$a_n = (-6)(-2)^{n-1}$

$a_{10} = (-6)(-2)^9$

$(-6)\cdot(-2)^9$

$= 3072$

GuidedPractice

3. Write an equation for the nth term of the geometric sequence 96, 48, 24, 12, … . Then find the tenth term of the sequence.

÷ 2 × $\frac{1}{2}$

find a_1
find r
answer the question

= (first)(r 'less)

$a_n = 96\left(\frac{1}{2}\right)^{n-1}$

$a_{10} = 96\left(\frac{1}{2}\right)^{9} = 0.1875$

$a_7 = 96\left(\frac{1}{2}\right)^{6}$

28. What is the 15th term of the geometric sequence $-9, 27, -81, \ldots$?

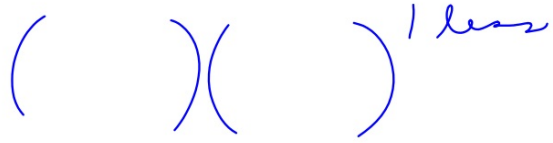
find a_1
find r
write an equation
answer the question

$r = -3$

$a_n = (-9)(-3)^{n-1}$

$a_{15} = -9(-3)^{14}$

$= -4304721$



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