Find the next three terms in each sequence.

1. 16, -24, 36, -54, ... 81, −121.5, 182.25

(−1.5) (−1.5) (−1.5)

repeatedly multiplying by 1.5

2. 6, 12, 36, 144, 720,... 4320 30240 241920

×2 ×3 ×4 ×5 ×6 ×7 ×8

multiplying by next integer

Sec 11-3: Geometric Sequence

Created by multiplying each term by the same number to get the next term..

The ratio between consecutive terms is constant.

r = Common Ratio

$$r = \frac{\text{Any term}}{\text{Previous term}} = \frac{a_n}{a_{n-1}}$$

Find the Common Ratio (r) in each Geometric sequence.

1. 6, 18, 54, 162, ... $r = \frac{18}{6} = 3$

2. 320, 80, 20, 5, ... $r = \frac{80}{320} = \frac{1}{4}$

Given the following Geometric Sequence

18, x , 882, ... Find the value of x

method 1

$18 \cdot r \cdot r = 882$

$18r^2 = 882$

$r^2 = 49$

$r = \pm 7$

Find the missing term by multiplying 18 by both +7 and -7

method 2

$\frac{x}{18} = \frac{882}{x}$

$x^2 = 15876$

$x = \pm\sqrt{15876} = \pm 126$

common ratio is the same any where in the sequence

x = 126 or −126

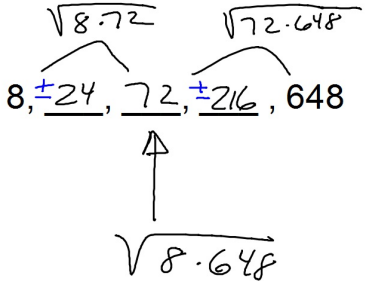
+x is called the Geometric Mean of 18 and 882.

Find the missing terms of this Geometric Sequence:

8, ___, ___, ___ , 648

Find the missing terms of this Geometric Sequence:

8, ___, ___, ___ , 648



One Method:

3rd term is the geometric mean of the 1st and 5th term
2nd term is the geometric mean of the 1st and 3rd term
4th term is the geometric mean of the 3rd and 5th term

Depending on whether the common ratio is positive or negative the 2nd and 4th terms could be ±

Find the missing terms of this Geometric Sequence:

8, ___, ___, ___ , 648

$8(r)(r)(r)(r) = 648$

$\frac{8r^4}{8} = \frac{648}{8}$

$\sqrt[4]{r^4} = \pm\sqrt[4]{81}$

$r = \pm 3$

Another Method:

Write an equation to find the common ratio.

Now start with 8 and multiply by ±3 to fill in the missing terms.

8, ±24, 72, ±216, 648