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

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

The Geometric Mean of any two number, a & b, is always found by...

$$\begin{array}{c} a, x, b \\ \frac{x}{a} = \frac{b}{x} \\ \sqrt{x^2} = \sqrt{ab} \\ x = \sqrt{ab} \end{array}$$

the geometric $\frac{x}{a} = \frac{b}{x}$ The geometric mean of two #'s is always the square root $x = \sqrt{ab}$ The square root of their product.

Given the following Geometric Sequence

9, x, 1296, ... Find the value of x

One method:

$$9 \cdot r \cdot r = 1296$$
 $9r^2 = 1296$
 $r^2 = 144$
 $r = \pm 12$

Now multiply 9 by both 12 and -12

$$\frac{x}{9} = \frac{1296}{x}$$

$$\sqrt{x^2 = 111669}$$

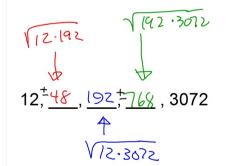
$$x = \pm 108$$

$$x = 108 \text{ or } -108$$

+x is called the Geometric Mean of 9 and 1296.

Find the missing terms of this Geometric Sequence: 12, ____, 3072

One method



another method

12,
$$\frac{48}{12}$$
, $\frac{192}{768}$, 3072
 $\frac{12}{12}$, $\frac{192}{768}$, 3072
 $\frac{12}{12}$, $\frac{13}{12}$, find the missing terms by multiplying by ± 4

192 can't be negative because if r is neg the signs will alternate and if the 1st term is pos the 2nd will be very & the 3rd will go back to pos.

Find the missing terms of this Geometric Sequence:

$$6, \frac{18}{18}, \frac{x^{3}}{54}, \frac{x^{3}}{162}, \frac{x^{3}}{486}, \frac{x^{3}}{1458}$$

$$6r^{5} = 1458$$

$$5\sqrt{r} = \frac{1458}{543}$$

$$r = 3$$

$$r = 3$$

$$r = 3$$

$$r = 3$$

rean't be-3 because
that would mean that
1458 would have to be
negative. Also, there is
only one odd root
of a number.