

Geometric Sequences and Series

Definition of a Geometric Sequence

General Term of a Geometric Sequence

$$a_1 = 5 \quad r = 3$$

$$a_1 = -6 \quad a_n = -5a_{n-1}$$

$$a_{12} \quad a_1 = 5, \quad r = -2$$

$$a_{40}, \quad a_1 = 1000, \quad r = -\frac{1}{2}$$

3, 12, 48, 192,

.0004, -.004, .04, -.4, ...

$$s_n = a_1 + a_1 r + a_1 r^2 + \dots + a_1 r^{n-2} + a_1 r^{n-1}$$

The Sum of the First n Terms of a Geometric Sequence

The Sum of an Infinite Geometric Series

Sum of the first 12 terms

$$2, 6, 18, 54, \dots$$

$$\frac{-3}{2}, 3, -6, -12, \dots$$

$$\sum_{i=1}^{10} 5 \cdot 2^i =$$

$$3 + \frac{3}{4} + \frac{3}{4^2} + \frac{3}{4^3} + \dots$$

$$1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \dots$$

$$.\bar{5} = \frac{5}{10} + \frac{5}{100} + \frac{5}{1000} + \dots$$

$$.\bar{47} = \frac{47}{100} + \frac{47}{(100)^2} + \frac{47}{(100)^3} + \dots$$