

A **Geometric Sequence** is a sequence in which every term after first term is found by multiplying the following term by a fixed number (i.e. common ratio).

Examples

2, 6, 18, 54, 162, , $2(3)^{n-1}$ where n represents position of the term.

$\frac{1}{2}, \frac{1}{5}, \frac{2}{25}, \frac{4}{125}, \dots, \frac{1}{2} \left(\frac{2}{5}\right)^{n-1}$ where n represents position of the term.

Writing Expression of for Geometric Sequences (integers)

Example

Using n to represent the position of the term and using n=1 for first term: -2, 8, -32, 128,

$a_1 = 1^{\text{st}} \text{ term} = -2$

Common ratio = $r = \frac{8}{-2} = -\frac{32}{8} = \frac{128}{-32} = -4$

Hence, nth term $a_n = a_1(r)^{n-1} = (-2)(-4)^{n-1}$

Writing Expression of for Geometric Sequences (rational numbers)

Example

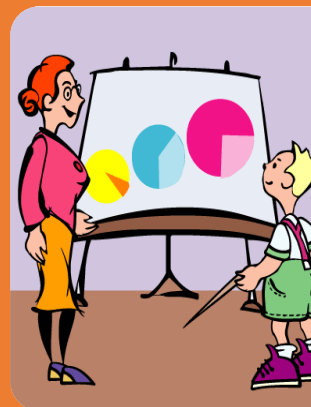
Using n to represent the position of the term and using n=1 for first term: $3, \frac{3}{4}, \frac{3}{16}, \frac{3}{64}, \dots$

$a_1 = 1^{\text{st}} \text{ term} = 3$

Common ratio = $r = \frac{3/4}{3} = \frac{3/16}{3/4} = \frac{3/64}{3/16} = \frac{1}{4}$

Hence, nth term $a_n = a_1(r)^{n-1} = (3)\left(\frac{1}{4}\right)^{n-1}$

Writing Expression for Geometric Sequences



Meets: Common Core Standard High School – HSA-SSE.B.4