Geometric Sequence

A **geometric sequence** is a number sequence that is generated by **multiplying** each successive term by the same number.

Here are two examples of geometric sequences:

* {2, 10, 50, 250, …}: Each term is generated by multiplying the previous term by 5.
* {8, 4, 2, 1, .5, .25,…}: Each term is generated by multiplying the previous term by PreCalB120_06_13_01i.

If you take any term in a geometric sequence and divide it by the term before it, you will obtain a constant value. This value is called the **common ratio** of the geometric sequence.

Common Ratio Formula

The symbol used for common ratio is *r*.

The common ratio is determined as PreCalB120_06_13_02i.

Example

Determine *r* for the geometric sequence PreCalB120_06_13_03i:

To find *r*, we only have to divide one term by the previous one PreCalB120_06_13_04i. We would have obtained the same value if we had used the 2nd and 3rd terms: PreCalB120_06_13_05i. The common ratio is PreCalB120_06_13_06i.

**Geometric Sequence Formula**

To describe a geometric sequence, use the following generalizations:

* *tn*: *t*1*rn*−1
* *tn*: the general term or the *n*th term of the geometric sequence
* *t*1: the first term of the sequence
* *n*: the number of terms or term number
* *r*: the common ratio