

TOC page 41 Geometric Sequences

Geometric Sequence: a sequence in which each term after the first is obtained by multiplying the preceding term by a fixed nonzero constant.

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Multiply each term by a common ratio

a_n	=	a_1	•	r	$n-1$
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↑
glue
down

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		plug in 1 st	plug in out common ratio	one less than the # of terms power
n th term		term		

common ratio - the amount by which we multiply each time; it is found by dividing any term after the first by the term that directly precedes it.

Find the common ratio.

$$1, 5, 25, 125, 625$$

$$\begin{array}{c} \xrightarrow{\times 5} \quad \xrightarrow{\times 5} \quad \xrightarrow{\times 5} \quad \xrightarrow{\times 5} \\ a_2 \quad a_3 \quad a_4 \quad a_5 \\ \frac{a_2}{a_1} \text{ or } \frac{a_3}{a_2} \\ \frac{5}{1} = 5 \end{array}$$

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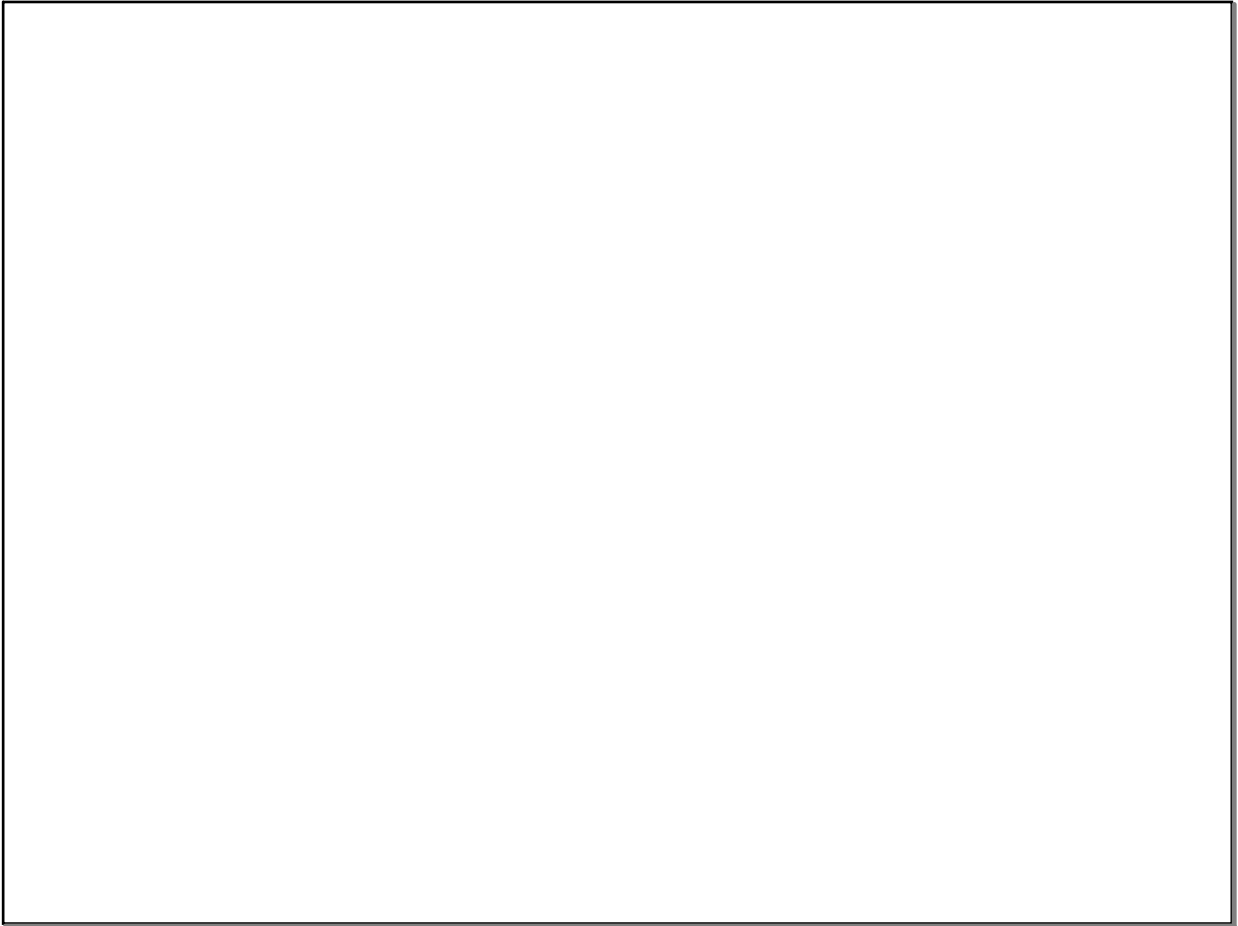
Example 1: Write the first six terms of the geometric sequence with the first term 12 and common ratio $-\frac{1}{2}$

$$\begin{array}{ll} a_1 = 12 \times \frac{-1}{2} & a_4 = -\frac{3}{2} \times \frac{-1}{2} = -1.5 \\ a_2 = -6 \times \frac{-1}{2} & a_5 = \frac{3}{4} \times \frac{-1}{2} = .75 \\ a_3 = 3 \times \frac{-1}{2} & a_6 = -\frac{3}{8} = -.4 \end{array}$$

Example 2: Find the seventh term of the geometric sequence whose first term is 5 and whose common ratio is -3 .

$$\begin{array}{l} a_n = a_1 \times r^{n-1} \\ a_7 = 5 \cdot (-3)^{7-1} \\ a_7 = 5 \cdot (-3)^6 \\ = 5(129) \\ = 3,645 \end{array}$$

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