

Section 1.3 : Geometric Sequences

geometric sequence: each term
is multiplied by a common ratio.

examples

$$1) \quad 2, 4, 8, 16 \quad r=2$$

$$2) \quad 6000, 3000, 1500, \dots \quad r=\frac{1}{2}$$

$$3) \quad -3, 9, -27, 81, \dots \quad r=-3$$

$$* \quad r = \frac{t_n}{t_{n-1}}$$

General rule

$$t_n = t_1 r^{n-1}$$

example

$$\{7, 14, 28, 56, \dots\}$$

$$r=2$$

$$t_n = 7(2)^{n-1}$$

$$\begin{aligned} t_5 &= 7(2)^{5-1} \\ &= 7(2)^4 \\ &= 7(16) \\ &= 112 \end{aligned}$$

$$\text{ex. 2) } \{81, 27, 9, \dots\}$$

$$\text{Find } t_6 \quad r = \frac{1}{3}$$

$$t_n = t_1 (r)^{n-1}$$

$$t_n = 81 \left(\frac{1}{3}\right)^{n-1}$$

$$t_6 = 81 \left(\frac{1}{3}\right)^{6-1} \Rightarrow 81 \left(\frac{1}{3}\right)^5$$

$$t_6 = \frac{81}{1} \left(\frac{1}{243}\right)$$

$$t_6 = \frac{81}{243} = \frac{1}{3}$$

$$\underline{\underline{\text{Solve}}}: \quad 4096 = 2^{n-1}$$

$$2^{12} = 4096$$

$$n = 13$$

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1, 2, 4, 6 a, b, c