GEOMETRIC SEQUENCES

Note Title 5/11/2012

- GEOMETRIC SEQUENCES INVOLVE MULTIPLYING INSTEAD OF ADDING.

  ×2 ×2

  EG 3, 6, 12, 24, 48 COMMON RATIO = 2

GEOMETRIC SEQUENCE: THE RATIO FORMED BY DIVIDING ANY TERM BY THE PRECEDING TERM IS A CONSTANT. THIS CONSTANT IS THE COMMON RATIO.

IE A) 3, 9, 27, 81, 243 — COMMON RATIO = 3

B) 2, −10, 50, −250 — COMMON RATIO = −5

C) 2, 4, 8, 12 — NOT A GEOMETRIC SEQUENCE

IE FIND THE MISSING TERMS

3, 12, 48, 192

$3 \times r \times r \times r = 192$

$\frac{3r^3}{3} = \frac{192}{3}$

$r^3 = 64$

$r = \sqrt[3]{64}$

$r = 4$

OR $t_n = ar^{n-1}$

$192 = 3r^{4-1}$

$\frac{192}{3} = \frac{3r^3}{3}$

$64 = r^3$

$4 = r$

IE FIND THE MISSING TERM

$5, \pm 30, 180$

Soln $t_n = ar^{n-1}$

$180 = 5r^{3-1}$

$$\frac{180}{5} = \frac{5r^2}{5}$$

$$36 = r^2$$

$$\pm 6 = r$$

IE A BACTERIA DOUBLES IN POPULATION EVERY HOUR, WITH A STARTING POPULATION OF 100, HOW MANY BACTERIA AFTER 4 HOURS?

$$t_n = ar^{n-1}$$

$$t_n = 100(2)^{5-1}$$

$$t_n = 100(2)^4$$

$$t_n = 1600$$

100 ___ ___ ___ ___

* GENERAL TERM — PLUG IN "a" AND "r"

IE $t_n = 100(2)^{n-1}$

HW Pg 47 # 1–12, 14