

### 1.3 Geometric Sequences

Determine if a pattern exists in the following sequences; describe the pattern

2, 4, 6, 8...

3, 6, 12, 24,...

-9, 3, -1, 1/3

#### Geometric Sequences:

A geometric sequence has a **common ratio**,  $r$ , between each successive terms:

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

**Example 1: Determine the common ratio of the following sequences:**

a.) 3, 6, 12, 24,...

b.) -9, 3, -1, 1/3

The **general term** of a geometric sequence for any term  $n$  is:

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

#### Example 2:

An ant colony starts off with a population of 100. At the end of each month, the population grows by 1.5 times.

a.) What is the general term of the sequence?

b.) After 2.5 years, how many ants are in the colony?

**Try:**

An oil company produces 1000 barrels at the end of the first week. In each subsequent week, they produce 30% less oil than the previous week.

a.) What is the general term of the sequence?

b.) After 12 weeks, how many barrels does the oil company produce?

**Example 3:**

In a geometric sequence, the second term is 28 and the sixth term is 2268. What is the first term and the common ratio?