




$5x-2y \leq 75$



$\begin{bmatrix} a & b \\ c & d \end{bmatrix}$



$S = Pe^{rt}$



$APY = (1 + \frac{r}{n})^n - 1$

## Math 1090 ~ Business Algebra

### Section 5.1 Arithmetic and Geometric Sequences

Objectives:

- Distinguish between arithmetic and geometric sequences.
- Recognize a sequence in recursive form and in iterative form.
- Find the nth term of a sequence.
- Find the sum of n terms of a sequence.

Vocabulary

Sequence:  $\{a_n\}$  an ordered list of numbers that form a pattern. It's also a function with domain of natural numbers.

Arithmetic Sequence

$n = 2, 3, \dots \quad d \neq 0$   
 $a_n = a_{n-1} + d \quad \text{given } a_1$   
 (Add the same number to get each of the next terms.)

Geometric Sequence

$n = 2, 3, \dots \quad d \neq 0$   
 $a_n = da_{n-1} \text{ given } a_1$   
 (Multiply by the same number to get each of the next terms.)

\* These formulas are recursive. (They depend on previous terms.)

$a_1$  given  
 $a_2 =$   
 $a_3 =$   
 $a_4 =$   
 $a_5 =$   
 .  
 .  
 .  
 $a_n =$

$a_1$  given  
 $a_2 =$   
 $a_3 =$   
 $a_4 =$   
 $a_5 =$   
 .  
 .  
 .  
 $a_n =$

\* These formulas are iterative. (They don't depend on previous terms.)

Ex 1: Classify as arithmetic or geometric and give the next three terms of each sequence.

a) 10, 7, 4, 1, . . .

b) 2, -6, 18, -54, . . .

Ex 2: Find a formula for the  $n$ th term of each of these.

a) an arithmetic sequence where

b) a geometric sequence where

$a_1 = 2$  and  $d = -3$

$a_1 = -10$  and  $d = 2$

Ex 3: Given  $a_1 = 2$  and  $a_8 = 23$ , find the 50th term of this arithmetic sequence.

Ex 4: Given  $a_1 = \frac{3}{2}$  and  $a_6 = \frac{3}{64}$ , find the 20th term of the geometric sequence.

Arithmetic Sequence Sum

$$S_{12} = 2+5+8+11+14+17+20$$
$$+23+26+29+32+35 = ?$$

Geometric Sequence Sum

$$S_n = a_1 + a_2 + \dots + a_n = ?$$

Ex 5: Find the sum of the first  $n$  terms of each of these.

a) 1, 10, 19, 28, ...  $n = 100$

b) 3, 6, 12, ...  $n = 10$