#### Arithmetic Sequence

Repeatedly adding the same number

#### Geometric Sequence

Repeatedly multiplying by the same number

# Recursive Formula for an Arithmetic Sequence:

 $a_1$  = The 1st Term

$$a_n = a_{n-1} + d$$

$$a_1 = 7$$

$$a_n = a_{n-1} + 6$$

## Sec 11-2: Arithmetic Sequences

Created by adding the same number each time.

The difference between consecutive terms is constant.

d = Common Difference = any term - previous term

$$d = a_n - a_{n-1}$$

# Write the recursive formula for this sequence:

$$d = 13.5$$

$$9_{n} = 9_{n-1} + 13.5$$

Write the recursive formula for this sequence:

$$a_1 = 56$$
 $a_n = a_{n-1} + -3$ 
 $a_{n-1} - 3$ 

Write the explicit formula for this sequence:

arithmetic 
$$d = 13$$
  
 $a_n = 47 + 13(n-1)$ 

Explicit Formula for an Arithmetic Sequence:

$$5, 9, 13, 17, 21, ...$$
 Find d.

$$a_1 = 5$$

$$a_2 = 5 + 4$$

$$a_3 = 5 + 4 + 4$$

$$a_4 = 5 + 4 + 4 + 4$$

$$a_5 = 5 + 4 + 4 + 4 + 4$$

Explicit Formula:

$$a_n = 5 + 4(n - 1)$$

**Explicit Formula for** any Arithmetic Sequence:

$$a_n = a_1 + (n - 1)d$$

Write the explicit formula for this sequence:

Grithmetic 
$$d=-8$$

$$G_n = 103 + -8(n-1)$$

Find the 13th term for this sequence:

5, 8, 11, 14, ...

arithmetic 
$$d = 3$$
 $a_n = 5 + 3(n-1)$ 
 $a_{13} = 5 + 3(i_{3-1}) = 4$ 

Given the two terms below are part of an Arithmetic Sequence, find the 16th term in the sequence.

$$a_{5} = 22$$
 $a_{16} = ?$ 
 $a_{23} = 94$ 

Below is one way to find  $a_{16}$ . There are other ways.

find the common difference:  $94 - 72 = 4$ 

If  $d = 4$  then  $a_{1} = 6$ 
 $a_{16} = 6 + 4(n-1)$ 
 $a_{16} = 6 + 4(16-1)$ 
 $a_{16} = 66$ 

Find the 99th term for this sequence:

32, 27, 22, 17, 12, ...

Arithmetic 
$$d = -5$$
 $a_n = 32 - 5(n - i)$ 
 $a_{99} = 32 - 5(99 - i) = -455$ 

You can now finish Hwk #30:

Sec 11-2

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Problems 2-5, 15, 16, 26, 27, 53, 54, 63

## Sec 11-3: Geometric Sequence

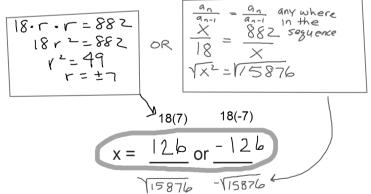
Created by multiplying each term by the same number to get the next term...

The ratio between consecutive terms is constant.

r = Common Ratio

# Given the following Geometric Sequence

18, x, 882, ... Find the value of x



+x is called the Geometric Mean of 18 and 882.

Find the Common Ratio (r) in each Geometric sequence.

1. 6, 18, 54, 162, ... 
$$r = 3$$

$$r = \frac{18}{6} \qquad r = \frac{\text{Any term}}{\text{Previous term}} = \frac{1}{2}$$
2. 320, 80, 20, 5, ...  $r = \frac{1}{2}$ 

$$r = \frac{\text{Any term}}{\text{Previous term}} = \frac{a_n}{a_{n-1}}$$

2. 320, 80, 20, 5, ... 
$$r = \frac{1}{4}$$