Name: _____ Date: _____

UNIT 5 **LESSON 3**

Do Now:

a. Identify the 1st term and the common difference for the sequence below:

7, 14, 21, 28.....

b. Write an explicit formula for the sequence.

c. Using the formula, find the *8th* term of the sequence.

AIM: RECURSIVE FORMULA

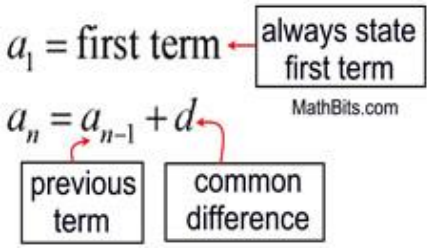
1. Could you state the term values for terms five through eight without using the formula?

7, 14, 21, 28.....

Recursive Formula

- Dependent on the previous term to develop a pattern.
- Gives you the n^{th} term of a sequence using the term before, *n-1*.
- To find a term using a recursive formula you need the previous term to find the next one.

a_1 = the first term in the sequence
a_n = the n^{th} term in the sequence
a_{n-1} = the term before the n^{th} term
n = the term number
d = the common difference.



2. Use the following to find the *first 4 terms* of the sequence:

$a_1 = -2$

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

3. Write the first 5 terms of the recursive sequence:

$a_1 = -4$

$a_n = a_{n-1} + 5$

4. Write the first 4 terms of the recursive sequence:

$a_1 = 12$

$a_{n+1} = a_n + 2$

To summarize the process of writing a recursive formula for an arithmetic sequence:

1. Determine if the sequence is arithmetic (*Do you add or subtract the same amount from one term to the next?*)
2. Find the common difference. (*The number you add or subtract.*)
3. Create a recursive formula by stating the first term, and then stating the formula to be the previous term plus the common difference.

5. State *recursive formula* for this sequence: 7, 11, 15, 19, 23, ...

6. State *recursive formula* for this sequence: 3, 5, 7, 9, 11, ...

7. State *recursive formula* for this sequence: 32, 38, 44, 50, …

8. Consider the sequence following: 35, 30, 25, 20, 15, 10, ...

a) Write a *recursive formula* for the sequence.

b) Write an *explicit formula* for the sequence.

c) Find the 18th term. Which formula is easier to use? Why?