ARITHMETIC SEQUENCES

Find the next two terms of each sequence and then describe the pattern.

1, 3, 5, 7, 9, _____, _____ Description: _____

2, 7, 12, 17, 22, _____, _____ Description: _____

-416, -323, -230, -137, _____, _____ Description: _____

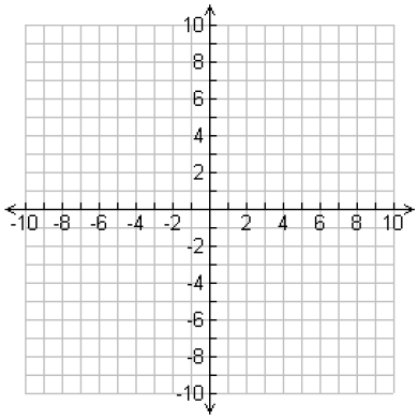
-2, -5, -8, -11, _____, _____ Description: _____

All of the patterns above are called arithmetic sequences. Hopefully you noticed something about their pattern that makes them similar. Complete the sentence below by writing a description of the pattern you noticed above.

Arithmetic sequences are sequences of numbers where_____
_____.

Let's look more closely at the first pattern 1, 3, 5, 7, 9… Suppose the domain is the *position* of a term (1, 2, 3, 4, etc.) and the range *is the term* (1, 3, 5, 7, 9, etc.).

Make a graph of the points that are made (position, term) with the pattern.



What quadrant(s) are these points in? Why?

What kind of graph do you have?

Write an equation for the graph.

How does this equation relate to the graph? How does this equation relate to the pattern?

Do you think the graphs of other arithmetic sequences would look similar? _____ Why or why not?

Find the three terms in the sequence after the last one given.

1) 24, 21, 18, 15, ...

2) 32, 25, 18, 11, ...

3) −31, −37, −43, −49, ...

4) 18, −182, −382, −582, ...

An **arithmetic sequence** is a sequence where the difference between consecutive terms is *constant.*	The difference between consecutive terms of an arithmetic sequence is called the **common difference.**
WRITING ARITHMETIC SEQUENCES	
Recursive Formula	**Explicit Formula**
IDENTIFYING ARITHMETIC SEQUENCES	
Is the sequence arithmetic? How do you know? 3, 6, 9, 12, 15, ...	Is the sequence arithmetic? How do you know? 2, 4, 8, 16, 32, ...
WRITING AND USING FORMULAS FOR ARITHMETIC SEQUENCES	
Given the arithmetic sequence $-3, -1, 1, 3, \ldots$ a) Write a recursive formula for the sequence. b) Write an explicit formula for the sequence c) What is the 56^{th} term of the sequence?	Given the arithmetic sequence $10, 5, 0, -5, \ldots$ a) Write a recursive formula for the sequence. b) Write an explicit formula for the sequence c) What is the 20^{th} term of the sequence?
What are the second and third terms of the sequence 100, , , 82, ... ?	

USING ARITHMETIC SEQUENCES TO SOLVE PROBLEMS

Over the last ten years, the amount of snow a town received formed an arithmetic sequence. If 21 inches of snow fell 10 years ago and 19 inches fell 9 years ago, how many inches fell 2 years ago? Explain.