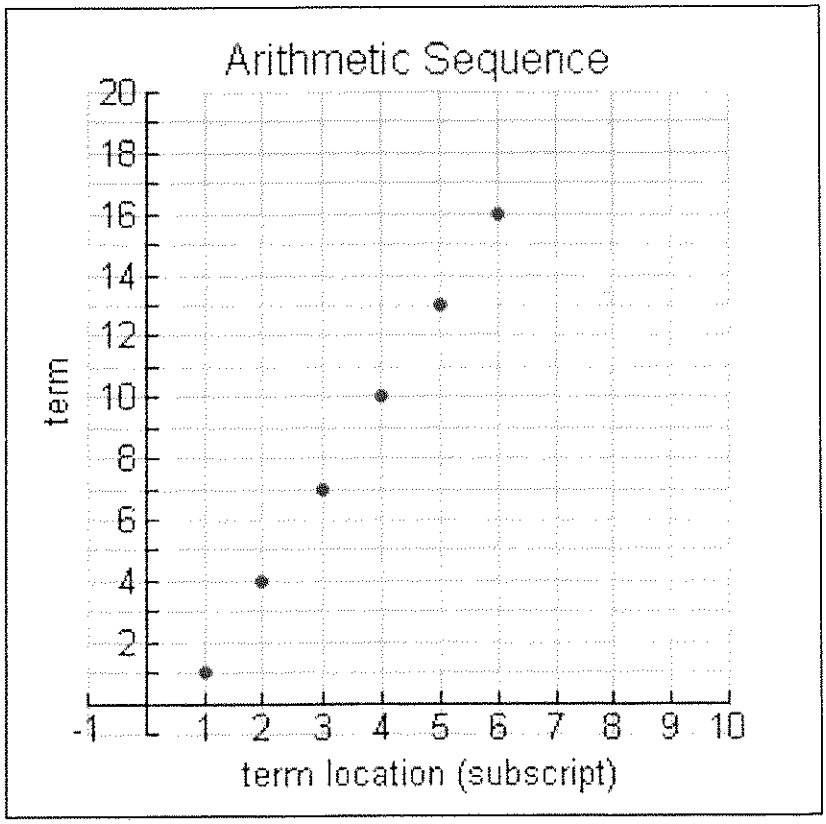
A sequence is an ordered list of numbers.
The **sum** of the terms of a sequence is called a **series.**

While some sequences are simply random values,
other sequences have a **definite pattern** that is used to arrive at the sequence's terms.
Two such sequences are the **arithmetic** and **geometric** sequences. Let's investigate the arithmetic sequence.

Arithmetic Sequences

If a sequence of values follows a pattern of **adding a fixed amount** from one term to the next, it is referred to as an **arithmetic sequence.** The number added to each term is constant (always the same).

The fixed amount is called the **common difference, *d*,** referring to the fact that the difference between two successive terms yields the constant value that was added. To find the common difference, subtract the first term from the second term.



Notice the **linear nature** of the scatter plot of the terms of an arithmetic sequence. The domain consists of the counting numbers 1, 2, 3, 4, ... and the range consists of the terms of the sequence. While the *x* value increases by a constant value of one, the y value increases by a constant value of 3 (for this graph).

Examples:

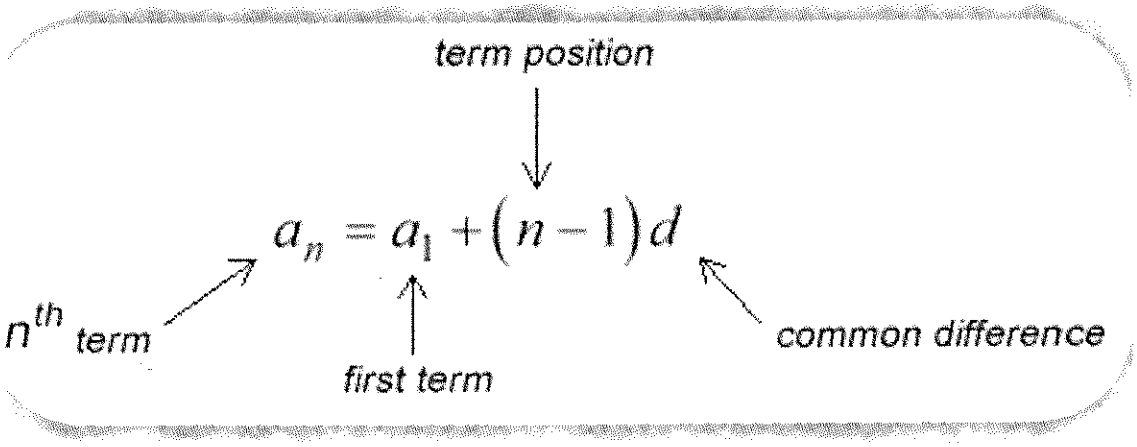
Arithmetic Sequence	Common Difference, *d*	
1, 4, 7, 10, 13, 16, ...	$d = 3$	add 3 to each term to arrive at the next term, or...the difference $a_2 - a_1$ is 3.
15, 10, 5, 0, -5, -10, ...	$d = -5$	add -5 to each term to arrive at the next term, or...the difference $a_2 - a_1$ is -5.
$1, \frac{1}{2}, 0, -\frac{1}{2}, \ldots$	$d = -\frac{1}{2}$	add -1/2 to each term to arrive at the next term, or....the difference $a_2 - a_1$ is -1/2.

Arithmetic Sequence:

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

Recursive Formula

a_n= next term
a_{n-1} = previous term
d = common difference



Explicit Formula

What type of function would this be?

Consider the sequence 2, 4, 6, 8, 10…

Explicit: $a_n = 2n + 0$
$a_n = 2n$

Recursive: $a_1 = 2$
$a_n = a_{n-1} + 2$