

Sequence: a list of numbers in a specific order.

A sequence is **arithmetic** if the differences between consecutive terms are the same.

4, 9, 14, 19, 24, ...
5 5 5 5

Term: each number in a sequence

How do I know if it is an arithmetic sequence?

Ex: 2, 4, 8, 16 ...

+2 +4 +8 No!

Ex: 48, 45, 42, 39 ...

-3 -3 -3 Yes!

Find the next three terms in the arithmetic sequence:

2, 5, 8, 11, 14, 17, 20, 23
+3 +3 +3 +3

Important Formulas for Arithmetic Sequence:

- Recursive Formula

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

- Explicit Formula

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

Where:

a_n is the n th term in the sequence

a_1 is the first term

n is the number of the term

d is the common difference

Write the explicit and recursive formula for each sequence

7, 11, 15, 19...

Recursive: $a_n = a_{n-1} + 4$
 Explicit: $a_n = 7 + (n-1)4$

Write the explicit and recursive formula for each sequence

^{+2 +2 +2 +2}
 2, 4, 6, 8, 10

Recursive: $a_n = a_{n-1} + 2$
 Explicit: $a_n = 2 + (n-1)2$

$$a_{45} = 2 + (45-1)2$$

90

Graph of Sequence

Consider the sequence 10, 4, -2, -8, ...

- a. Write a recursive formula for the sequence.

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

$a_{n-1} + -6$

- b. Write an explicit formula for the sequence.

$$a_n = 10 + (n-1)-6$$

- c. Find the 42nd term of the sequence.

$$a_{42} = 10 + (42-1)-6$$

$$10 + -246 = -236$$

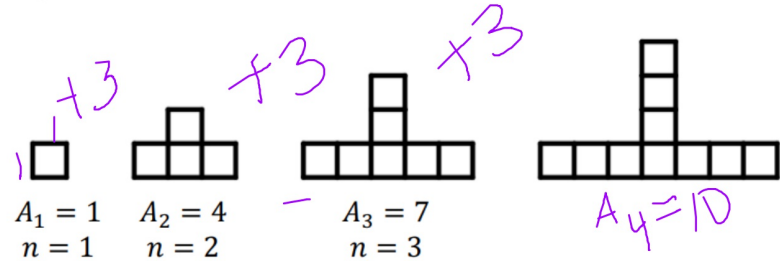
Suppose you have saved \$75 towards the purchase of a new iPad. You plan to save at least \$12 from mowing your neighbor's yard each week. In all, what is the minimum amount of money you will have in 26 weeks?

$$a_n = 75 + (n-1)12$$

$$a_{26} = 75 + (26-1)12$$

\$375

The following figures were created with squares, where each side of the squares has a length of exactly one unit. A_1 represents the area of the first figure, A_2 represents the area of the second figure, and so on. Based on this pattern, what would be the rule for the area of the n^{th} figure when $n > 1$?



- (A) $A_n = 2A_{n-1} - 2$
- (B) $A_n = 2A_{n-1} + 4$
- (C) $A_n = A_{n-1} + 3$
- (D) $A_n = A_{n-1} + 2$