sequences

Arithmetic Sequences

Arithmetic Sequence

- Each term, after the first is found by adding a common difference

- Example: 4, 6, 8, 10, …

$a_1 \rightarrow$ (value of the first term) 4

$n \rightarrow$ (which term it is)

$d \rightarrow$ (common difference: $a_n - a_{n-1}$)

Is the following arithmetic? If so, find the common difference.

- -4, -1, 2, 5, 8, … *yes d = 3*

  -1 - -4 = 3

- 7, 3, -1, -5, -9, … *yes d = -4*

  3 - 7 = -4

- 3, 6, 12, 24, … *No*

- 3, 8 *Not enough info*

Use the recursive formula given to find the first four terms of the arithmetic sequence given.

$$t_1 = 7$$

$$t_n = t_{n-1} - 3$$

Use the recursive formula given to find the first four terms of the arithmetic sequence given.

$$t_1 = -2$$

$$t_n = t_{n-1} + 6$$

List the first three terms of the arithmetic sequence below:

$$t_n = 2n - 3$$

$$-1, \ 1, \ 3\ldots$$

List the first three terms of the arithmetic sequence below:

$$t_n = 5 + (n-1)(3)$$

Let's figure out the explicit formula!

1st term: a_1

2nd term: $a_1 + d$

3rd term: $a_1 + d + d = a_1 + 2d$

4th term: $a_1 + 2d + d = a_1 + 3d$

10th term: $a_1 + 9d$

nth term:

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

Write an explicit formula for the *n*th term of the arithmetic sequence below:

12, 15, 18, 21, 24, …

$a_1 = 12$

$d = 3$

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

$a_n = 12 + (n-1)(3)$

$a_n = 12 + 3n - 3$

explicit $\boxed{a_n = 3n + 9}$

Write an explicit formula for the *n*th term of the arithmetic sequence below:

4, 1, -2, -5, -8, …

$d = -3$

$a_1 = 4$

$a_n = 4 + (n-1)(-3)$

$a_n = 4 - 3n + 3$

$a_n = -3n + 7$