

Algebra 1 3.5

Recognize arithmetic sequences

Relate arithmetic sequences to linear functions...tricky
sequence

term

arithmetic sequence +

common difference (d)

whiteboards

d (rule)


2, 4, 6, 8...

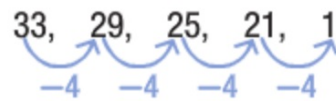
KeyConcept Arithmetic Sequence

Words

An arithmetic sequence is a numerical pattern that increases or decreases at a constant rate called the *common difference*.

Examples

3, 5, 7, 9, 11, ...

 $d = 2$

33, 29, 25, 21, 17, ...

 $d = -4$ or $+^{-}4$

$$y = 3 + (n-1)2$$

$$y = 33 + (n-1)^{-}4$$

KeyConcept n th Term of an Arithmetic Sequence

The n th term of an arithmetic sequence with first term a_1 and common difference d is given by $a_n = a_1 + (n - 1)d$ where n is a positive integer.



Why is it one less????

$$-12 + (4)(4)$$

$$-12 + 16$$

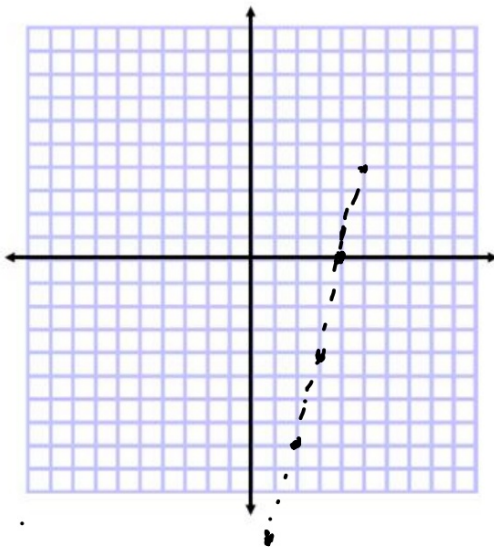
Example 3 Find the n th Term

- a. Write an equation for the n th term of the arithmetic sequence $-12, -8, -4, 0, \dots$

$$y = -12 + (n-1) \cdot 4$$

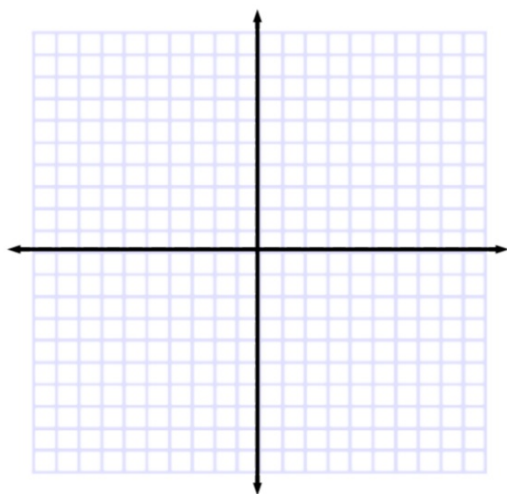
b.

c.



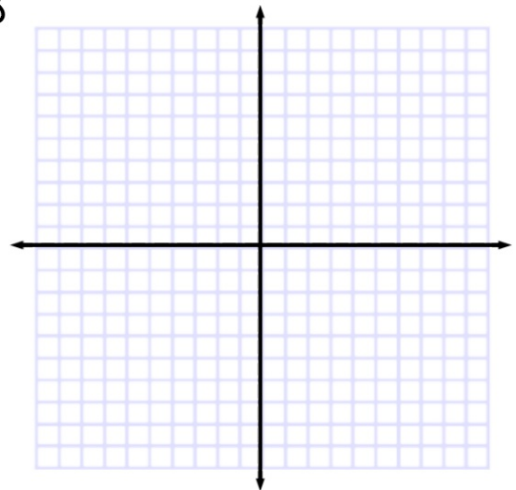
1	-12
2	-8
3	-4
4	0
5	4

uence.



c. Graph the first five terms of the sequence.

n	$4n - 16$	a_n	(n, a_n)
1	-12		1, -12
2	-8		2, -8
3	-4		3, -4
4	0		4, 0
5	4		5, 4



d. Which term of the sequence is 32?

6	8	11	28
7	12	12	32
8	16		
9	20		
10	24		

12th term

Guided Practice $d = -13$

Consider the arithmetic sequence $3, -10, -23, -36, \dots$

3A. Write an equation for the n th term

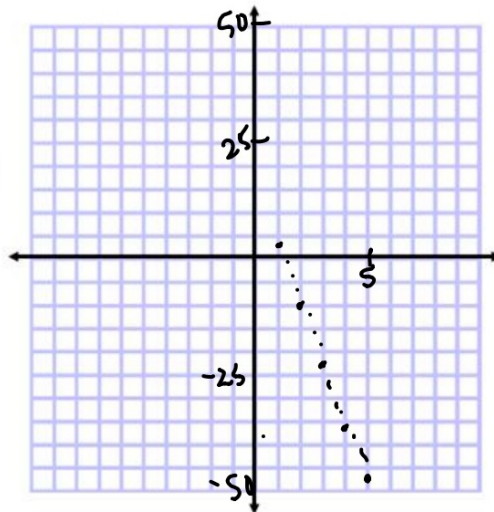
3B. Find the 15th term in the sequence

3C. Graph the first five terms of the sequence

3D. Which term of the sequence is -11 ?

1	3
2	-10
3	-23
4	-36 $+ -13$
5	-49

not



Guided Practice

4. **TRACK** The chart below shows the length of Martin's long jumps.

$d = 1.5$ $\begin{matrix} x \\ y \end{matrix}$

Jump	1	2	3	4
Length (ft)	8	9.5	11	12.5

A. Write a function to represent this arithmetic sequence.

B. Then graph the function.

$$y = 8 + (n-1)(1.5)$$

