Algebra 1 3.5 adding rule (Subtr.)

Recognize arithmetic sequences

Relate arithmetic sequences to linear functions...tricky

sequence

term

arithmetic sequence

common difference (d) rule

whiteboards

2, 4, 6, 8..10, 12, 14...

First term is 8, and common difference is 3...

# term	term
1	8
2	11 +3
3	14 +3+3
4	17 +3+3+3
5	20 +3+3+3+3

= first + (one less) rule

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

$a_n = 8 + (n-1)3$

Term	Symbol	In Terms of a_1 and d	Numbers
first term	a_1	a_1	

$a_{10} = 8 + (9) \cdot 3$

$= 8 + 27$

$= 35$

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.

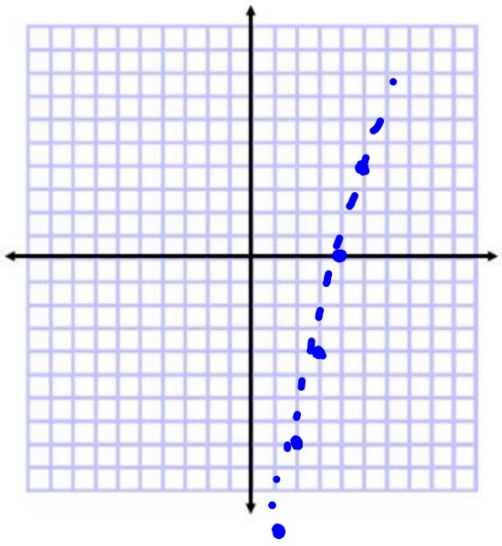
Why is it one less????

Example 3 Find the *n*th Term

a.

b.

c.



f the arithmetic sequence

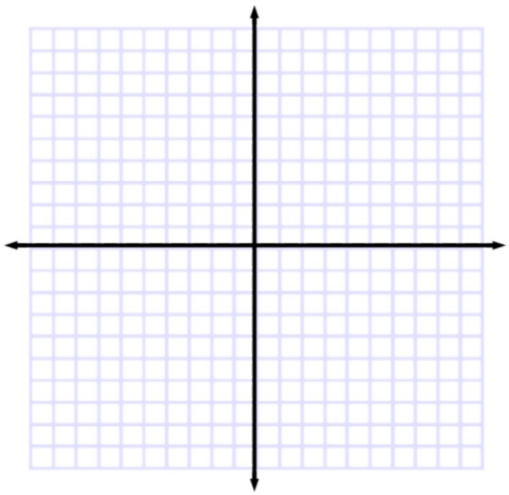
-1)(4)

4
=20

uence.

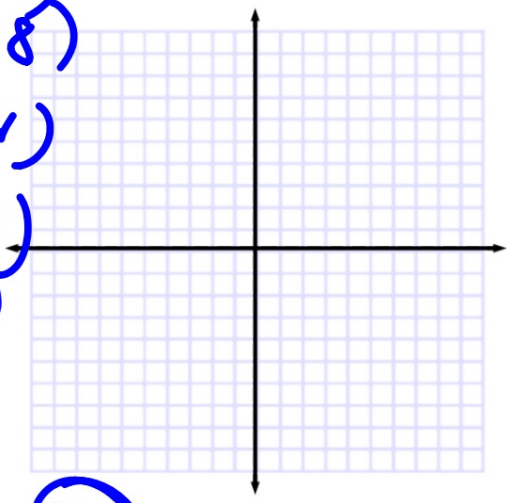
x	y
1	-12
2	-8
3	-4
4	0
5	4

Think of them like ordered pairs…
(because they are)



c. Graph the first five terms of the sequence.

n	$4n - 16$	a_n	(n, a_n)
1	4-16	-12	(1, -12)
2	8-16	-8	(2, -8)
3	12-16	-4	(3, -4)
4	16-16	0	(4, 0)
5	20-16	4	(5, 4)
6	24-16	8	
7	28-16	12	
8	32-16	16	
9	36-16	20	
10	40-16	24	
11	44-16	28	
12	48-16	32	



d. Which term of the sequence is 32?

32

GuidedPractice

Consider the arithmetic sequence 3, −10, −23, −36, … .

3A. Write an equation for the nth term of the sequence.

3B. Find the 15th term in the sequence.

3C. Graph the first five terms of the sequence.

3D. Which term of the sequence is −114?

−13 −13 −13

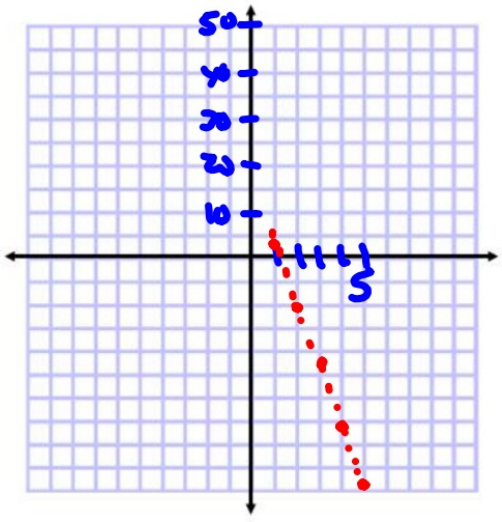
$y = 3 + (n-1)(-13)$

$= 3 + (14)(-13)$

$= -179$

10th

1	3
2	-10
3	-23
4	-36
5	-49
6	-62
7	-75
8	-88
9	-101
10	-114



GuidedPractice

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

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

+1.5 +1.5 +1.5

A. Write a function to represent this arithmetic sequence.

B. Then graph the function.

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