

4.6 Arithmetic Sequences with work

Algebra 1: 4.6 Arithmetic Sequences

Learning Outcomes:

- Write the terms of arithmetic sequences
- Graph arithmetic sequences
- Write arithmetic sequences as functions

Sequence: a set of numbers in a specific order

Arithmetic Sequence: the terms increase or decrease by a constant rate called the common difference

(note: 1, 2, 4, 8, 16 ... is a sequence but not an arithmetic sequence)

ex. 7, 12, 17, 22, 27, ...

terms: 7 is the 1st term, 12 is the 2nd term

ellipsis - the name of the symbol ...

common difference (d): $d = 5$ (found by $\text{term}_2 - \text{term}_1$)

Nov 8-8:15 PM

Example 1: Determine whether each sequence is arithmetic. Justify your answer.

a. -15, -13, -11, -9, ... *yes*
 $+2 \quad +2 \quad +2$

b. $\frac{7}{8}, \frac{5}{8}, \frac{1}{8}, -\frac{5}{8}, \dots$ *NO*
 $-\frac{2}{8} \quad -\frac{4}{8} \quad -\frac{6}{8}$

Example 2: Find the next 3 terms of this arithmetic sequence:

-8, -11, -14, -17, ...
 $-3 \quad -3 \quad -3$ $-20, -23, -26$

Nov 8-8:22 PM

4.6 Arithmetic Sequences with work

term	symbols
a_1	a_1
a_2	$a_1 + d$
a_3	$a_1 + 2d$
a_n	$a_1 + (n-1)d$

★ To find the nth term () of an arithmetic sequence

Example 3: Find the 100th term in the arithmetic sequence:

7, 11, 15, 19, ... 23, 27, 31, 35, 39,

Think our way thru:

+4 +4 +4

1) General Equation for an arithmetic sequence:

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

2) Write the equation for Ex. 3 and simplify it:

$$7 + (100-1)(4)$$

$$7 + 99 \cdot 4 \Rightarrow 7 + 396 = \boxed{403}$$

Nov 8-8:30 PM

Example 4: Consider the arithmetic sequence:

-8, 1, 10, 19, ...

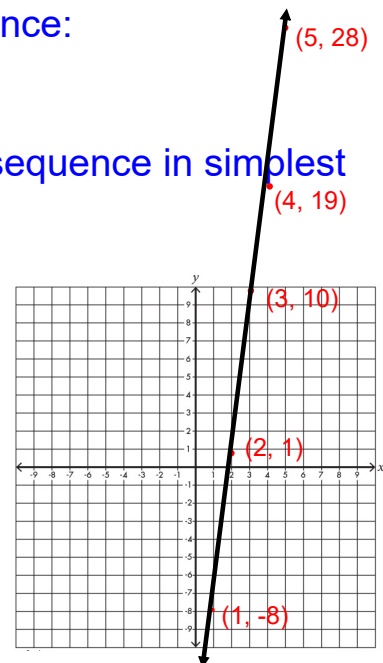
+9 +9 +9

a. Write an equation for the nth term in the sequence in simplest form:

$$a_n = -8 + (n-1)(9)$$

$$= -8 + 9n - 9$$

$$\boxed{a_n = 9n - 17}$$



b. Find the 12th term of the sequence.

$$a_{12} = 9(12) - 17 = 91$$

c. Graph the first five terms of the sequence.

$$a_5 = 9(5) - 17 = 28$$

Nov 8-8:38 PM

4.6 Assignment:

pg. 214

Nov 21-12:34 PM