Warm Up

September 26, 2018

1.) Write a linear function with a x-intercept of 2 and av-intercept of -3)

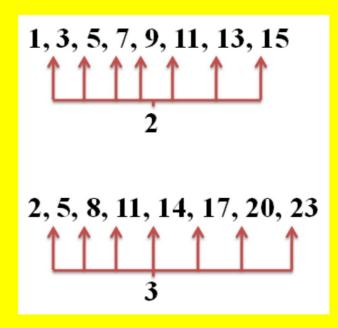
$$m = -\frac{3-0}{0-2} = -\frac{3}{3} = \frac{3}{3} = \frac{3}$$

2.) A function is shown in the table below. Which interval had the smallest rate of change?

D.) 9 to 11" 30

X	f(x)
0	1,750
3	1,900
7	1,950
9	2,180
11	2,240

Arithmetic Sequences



What is it?

Main Ideas/Questions	Notes
(Ac:Theoretic	a sequence in which the same number is repeatedly added or subtracted.
Common	the number repeatedly added
Difference	or subtracted; variable d

Identifying an Arithmetic Sequence Determine whether the sequences are arithmetic sequences. If yes, identify the common difference.

1. 1, 5, 9, 13, ...

2. 1, 3, 5, 8, ...

3. 8, 6, 4, 2, ...

- **4.** -5, -8, -11, -14, ...
- **5.** 5, 10, 20, 40, ...
- **6.** 7, 6, 5, 4, ...

One Step Further....

Write a NEXT/NOW statement for the arithmetic sequences above.

1.) 1, 5, 9, 13 Arithmetic? Yes or NO Common Difference (d) = $_$ H NEXT = $_$ NOW + +L

2.) 1, 3, 5, 8 Arithmetic? Yes or NO Common Difference (d) = ______NO NEXT = _____

Continuing Arithmetic Sequences Given the arithmetic sequence, find the next three terms.

7.) NEXT =
$$NOW+4$$

8.) NEXT =
$$NOW-3$$

Arithmetic Sequences: THE EXPLICIT FORMULA

Arithmetic sequence Formula

The nth term of an arithmetic sequence can be found using the following formula:

Arithmetic sequence
$$Q_n = Q_1 + d(n-1)$$
 $d = Common$
 $Q_n = d(n-1) + Q_1$
 $d = d(n-1) + Q_1$

Examples:

Examples Write the rule for the nth term. then find a19.

$$\begin{array}{c|c}
 & 1 & 3 & 4 \\
\hline
 & 10.7, 13, 19, 25, ... & d= _____
\end{array}$$

$$Q = 7 + (n-1)(0) \quad a_1 = _____$$

$$\alpha_{19} = 0(19-1)+1$$
 $\alpha_{17} = 070-0+7$
 $\alpha_{19} = 115$
 $\alpha_{17} = 070-0+7$

11. 30, 26, 22, 18,...

$$Q_{n} = -4(n-1) + 30$$

$$Q_{19} = -4(19-1)+30$$
 $Q_{19} = -42$
 $Q_{19} = -42$
 $Q_{19} = -42$
 $Q_{19} = -42$
 $Q_{19} = -42$

$$a_{1} = \frac{-10}{3}$$

$$a_{1} = \frac{-10}{3}$$

$$a_{1} = \frac{-10}{3}$$

$$a_{2} = \frac{-10}{3}$$

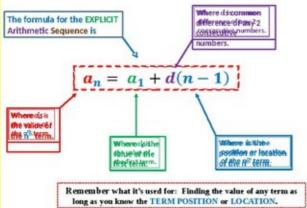
$$a_{3} = \frac{-10}{3}$$

$$a_{1} = \frac{-10}{3}$$

$$a = 34$$
 d= $a = 3\pi$

Explicit

Explicit Formula



Finding any term.

Recursive

Recursive Formula

If you know any term of an arithmetic sequence and you know the common difference of the sequence, you can find the next term.

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

$$NEXT = NOW + d$$

Finding next term.

Real Life Applications

Real Life Applications

- **16.** You visit the Grand Canyon and drop a penny off the edge of the cliff. The distance the penny will fall is 16 feet for the first second,48 feet the next second, 80 feet the third second, and so on.
 - a. Write a formula to represent this sequence.

$$Q_{\eta} = 32(\eta - 1) + 10$$

$$Q_{\eta} = 32(\eta - 1)$$
b. How far will the penny have traveled after 6 seconds?
$$Q_{\eta} = 32(0) - 10 = 1700 + 1$$

d=295.8 a₁=15205

- **17.** The total bank loan for Sarah's new car is \$15,265. The bank automatically withdraws \$295.80 each nonth to pay off the car.
 - a. Write a formula to represent this sequence.

$$\alpha_{\pi} = -395.80(\pi - 1) + 15365$$

 $\alpha_{\pi} = -395.80\pi + 15930.80$

b. What will be the balance of the loan aftel 2 years?