

Connecting Sequences, Slope, Linear Functions, & Equations

Can you figure out how to take an arithmetic sequence and write it as a linear equation in slope-intercept form?

Try this: -5, 0, 5, 10, ... $y = mx + b$

term	value
x	y
1	-5
2	0
3	5
4	10

(2,0) (4,10)

$$\frac{y}{x} = \frac{10-0}{4-2} = \frac{10}{2} = 5$$

$$y = mx + b \quad (2,0)$$

$$0 = 5(2) + b$$

$$0 = 10 + b$$

$$-10 = b$$

$$m = 5$$

$$b = -10$$

$$y =$$

$$y = 5x - 10$$

Steps:

1. Create a t table using the terms and values from the sequence.

2. Pick 2 ordered pairs from the t table. You will use these to help write the equation of the arithmetic sequence in slope-intercept form. (You may use any two and get the same equation - WOW!)

3. Use the 2 ordered pairs to write an equation in slope-intercept form. (Use the 3 steps from yesterday : find slope, find y-int, write equation.)

Write the linear equation of this arithmetic sequence.

3, 1, -1, -3, ...

term	value
X	Y
1	3
2	1
3	-1
4	-3

(1, 3) (2, 1)

$$\frac{y}{x} = \frac{3-1}{1-2} = \frac{2}{-1} = -2$$

$$m = -2$$

$$b = 5$$

$$y = mx + b \quad (2, 1)$$

$$1 = -2(2) + b$$

$$1 = -4 + b$$

$$+4 \quad +4$$

$$5 = b$$

$$\boxed{y = -2x + 5}$$

Write an equation in slope-intercept form from the following arithmetic sequence: -2, 1, 4, 7, ...

x	y
1	-2
2	1
3	4
4	7

$$\frac{y}{x} = \frac{4-1}{3-2} = \frac{3}{1} = 3$$

$$(0, -5)$$

$$m = 3$$

$$b = -5$$

$$y = mx + b \quad (2, 1)$$

$$1 = 3(2) + b$$

$$1 = 6 + b$$

$$\underline{-6} \quad -6$$

$$-5 = b$$

Write an equation in slope-intercept form from the following arithmetic sequence: 4, 8, 12, 16, ...

x	y
1	4
2	8
3	12
4	16
0	0

$(1, 4)$ $(2, 8)$

$$\frac{y}{x} = \frac{8-4}{2-1} = \frac{4}{1} = 4$$

$$m = 4$$

$$b = 0$$

$$y = 4x + 0$$

$$\boxed{y = 4x}$$

Write an equation in slope-intercept form from the following arithmetic sequence: -2, -5, -8, -11, ...

x	y
1	-2
2	-5
3	-8
4	-11
0	1

$$y = -3x + 1$$