

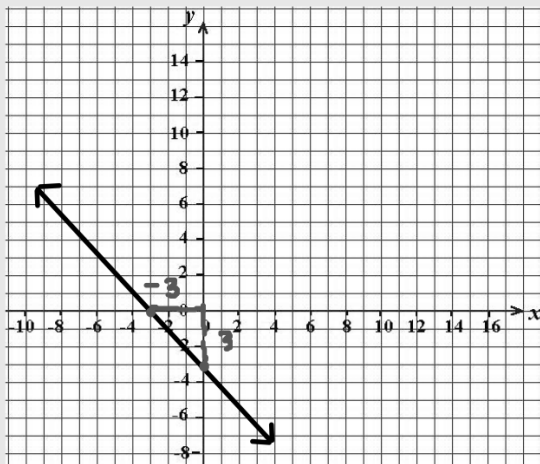
Writing Linear Equations

There are 2 ways to write linear equations:

A. Use slope and y -intercept from a graph

B. Use 2 points on the line

Use slope and y-intercept to write the equation of the line.



a. $y = 2x$

b. $y = -2x$

c. $y = -x - 3$

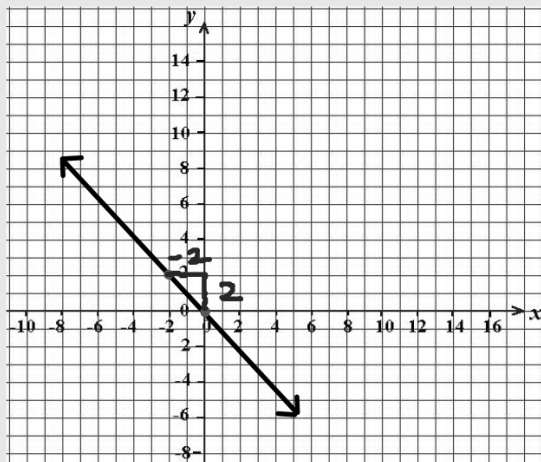
d. $y = x - 1$

$y = mx + b$

$\frac{\text{rise } 3}{\text{run } 3} = 1$

$y = -x - 3$

Use slope and y-intercept to write the equation of the line.



$\frac{2}{-2} = -1$ $y = mx + b$
 $y = -1x + 0$
 $y = -x$

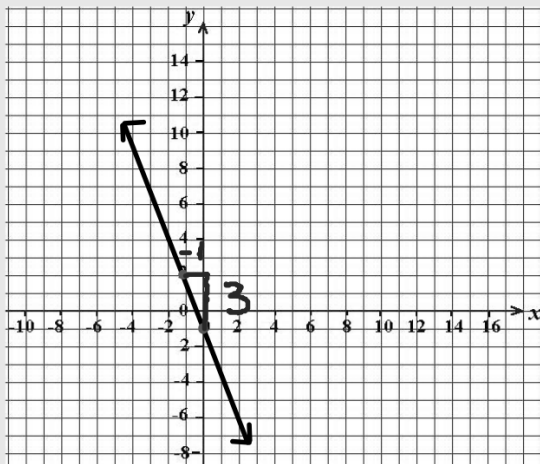
a. $y = x + 1$

b. $y = -x + 1$

c. $y = -x$

d. $y = x - 1$

Use slope and y -intercept to write the equation of the line.



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

~~a. $y = 3x + 3$~~

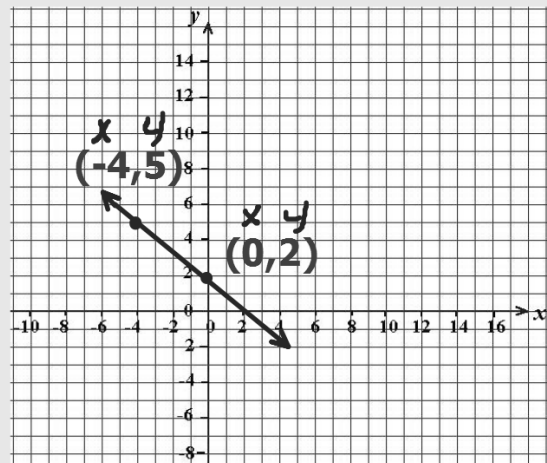
b. $y = -3x - 1$

~~c. $y = -3x$~~

d. $y = 3x - 1$

B. Write the Linear Equation Given Two Points

The line at the right models a snowboarder's decent down a mountain. Write the equation of the line in slope-intercept form.



1. Find the slope.

$$m = \frac{\text{change in } y\text{'s}}{\text{change in } x\text{'s}} = \frac{5-2}{-4-0} = \frac{3}{-4} = \left(-\frac{3}{4}\right) = m$$

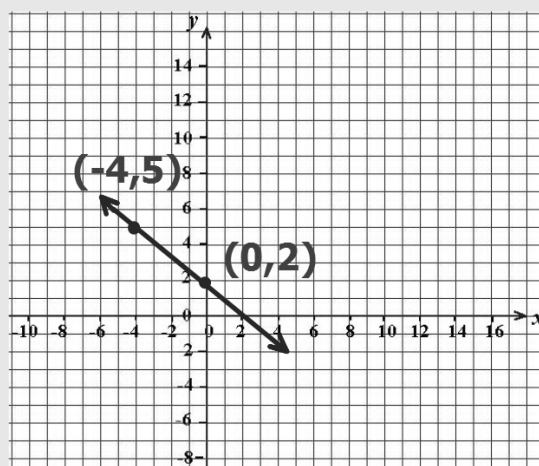
2. Find the y-int

3. Write the equation of the line. From the graph, you can see the y intercept is $b = 2$. Now that you have the slope and y intercept, you can write the equation in slope-intercept form.

$$m = -\frac{3}{4} \quad b = 2$$

$$y = mx + b$$

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



The equation of the line is $y = -\frac{3}{4}x + 2$

Write in slope-intercept form the equation of the line that passes through the points $(3, -2)$ and $(6, 6)$.

1. Find the slope.

$$m = \frac{\text{y's } 6 - (-2)}{\text{x's } 6 - 3} = \frac{8}{3}$$

2. Find the y-intercept.

Use one of the points to substitute into the slope-intercept formula to help you solve for b.

$$\begin{aligned} (3, -2) \quad y &= mx + b \\ -2 &= \frac{8}{3}(3) + b \\ \frac{8}{3} \cdot \frac{3}{1} &= 8 \quad -2 = 8 + b \\ -2 - 8 &= 8 - 8 + b \\ -10 &= b \end{aligned}$$

3. Now that you have your slope and y intercept, write the equation of the line in slope intercept form.

$$y = mx + b$$

$$y = \frac{8}{3}x - 10$$

Write the equation of the line that goes through the points $(-1, 0)$ and $(0, -3)$.

① Find slope -

$$m = \frac{y}{x} = \frac{-3-0}{0-(-1)} = \frac{-3}{1} = -3$$



② y-Int

$$\begin{aligned} (0, -3) \quad y &= mx + b \\ -3 &= -3(0) + b \\ -3 &= 0 + b \\ -3 &= b \end{aligned}$$

③ Write Eq.

$$y = -3x - 3$$

Write the equation of the line that goes through the points (0, 1) and (-1, -3).

Write the equation of the line that goes through the points $(-5, 7)$ and $(2, -7)$.

① Find slope

$$m = \frac{y}{x} = \frac{7 - (-7)}{-5 - 2} = \frac{14}{-7} = \textcircled{-2}$$

② y-Int

$(2, -7)$ $y = mx + b$

$$-7 = -2(2) + b$$

$$-7 = -4 + b$$

$$\frac{+4}{+4}$$

$$\textcircled{3 = b}$$

③ Write Eq.

$$y = mx + b$$

$$\boxed{y = -2x + 3}$$

Write the equation of the line that goes through the points $(-7, 2)$ and $(-7, -7)$.

① Find slope

$$\frac{y}{x} = \frac{-7-2}{-7-7} = \frac{-9}{0} = \text{no slope}$$

So: must have an $x = \#$ equation.

$\boxed{x = -7}$ because both of my x 's are -7 !

Write the equation of the line that goes through the points (0, 2) and (2, 2).

① Find slope

$$m = \frac{y}{x} = \frac{2-2}{2-0} = \frac{0}{2} = 0$$

② y-Int

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

$$2 = b$$

③ Eq. $(y = 0x + 2)$

$$\boxed{y = 2}$$

