Math Virtual Learning

Pre-Algebra

Equation of a Line from a Graph

May 15, 2020

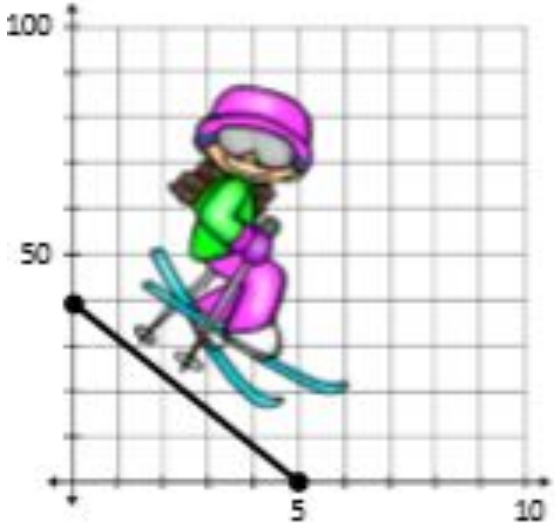
Pre-Algebra
Lesson: May 15, 2020

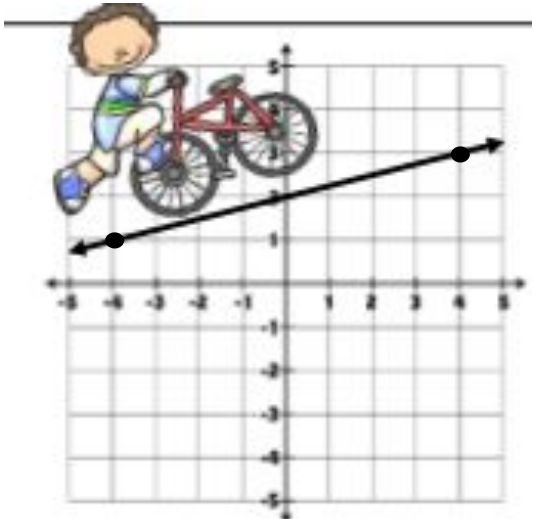
Objective/Learning Target:
I can write an equation from a graph.

Warm-Up:

Answers on next slide

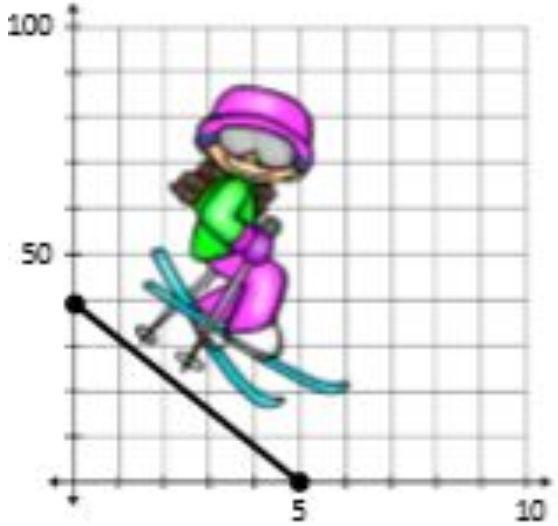
Find the slope of each line. (*Remember to simplify / reduce the fraction.*)

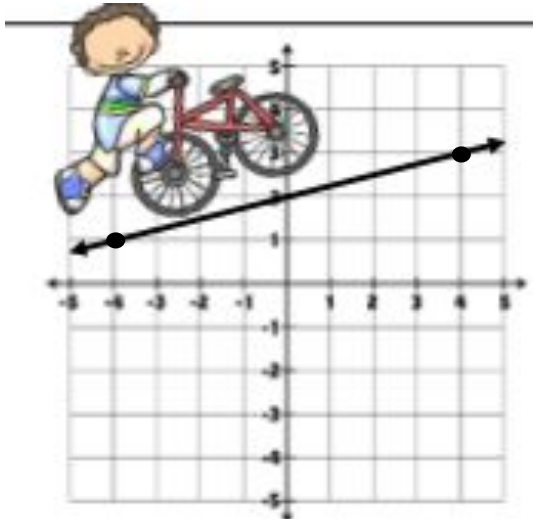




Notice the scale of the y-axis goes by 10!

Warm-Up: *Answer Key*





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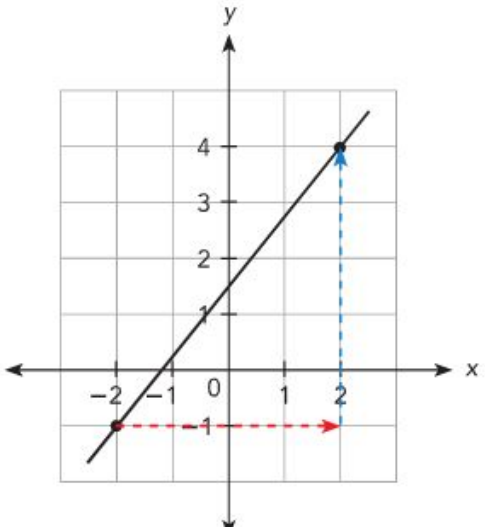
Review: How to Count Slope from a Graph

a)

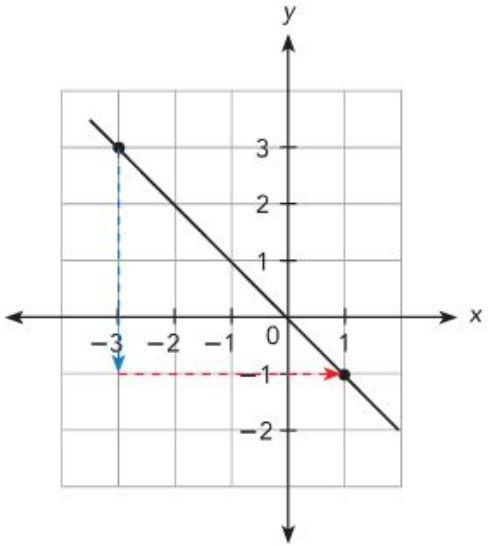


The graph passes through the points $(-2, -1)$ and $(2, 4)$.

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}}$$

$$= \frac{4 - (-1)}{2 - (-2)}$$

$$= \frac{5}{4}$$



The graph passes through the points $(-3, 3)$ and $(1, -1)$.

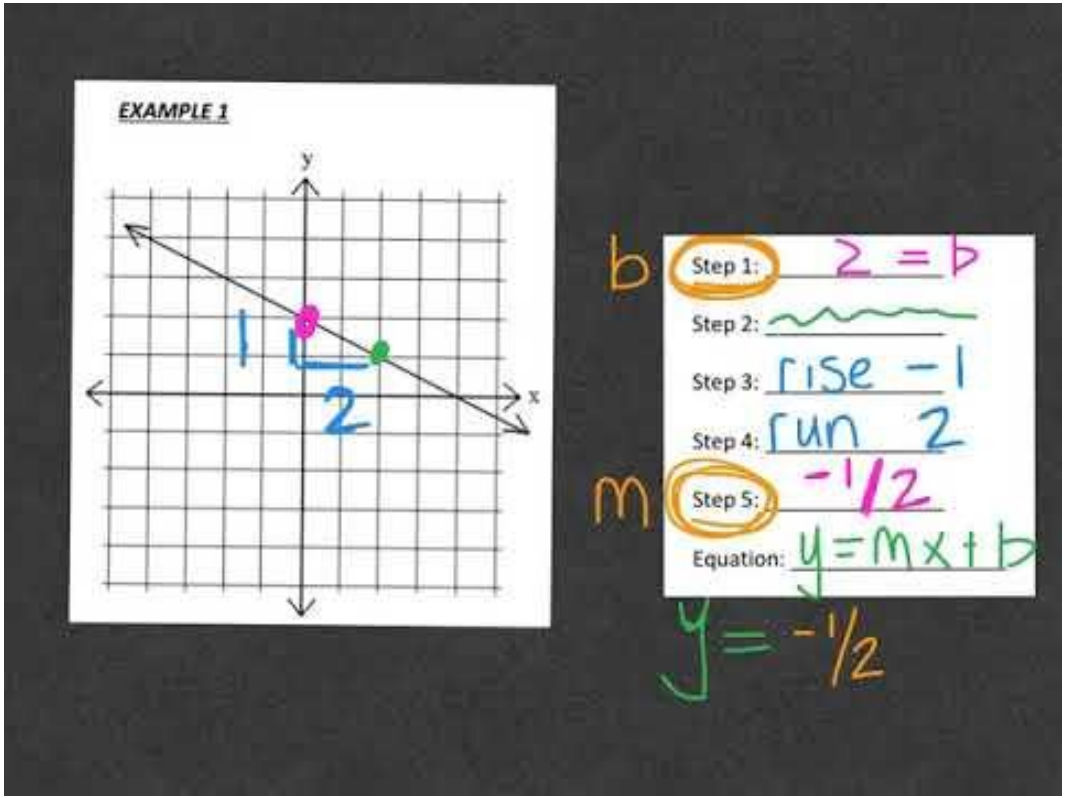
$$\text{Slope} = \frac{\text{Rise}}{\text{Run}}$$

$$= \frac{-1 - 3}{1 - (-3)} \quad = \frac{-4}{4} \quad = -1$$

The slope is -1.

Video:

Take notes on a piece of paper as you watch this video.

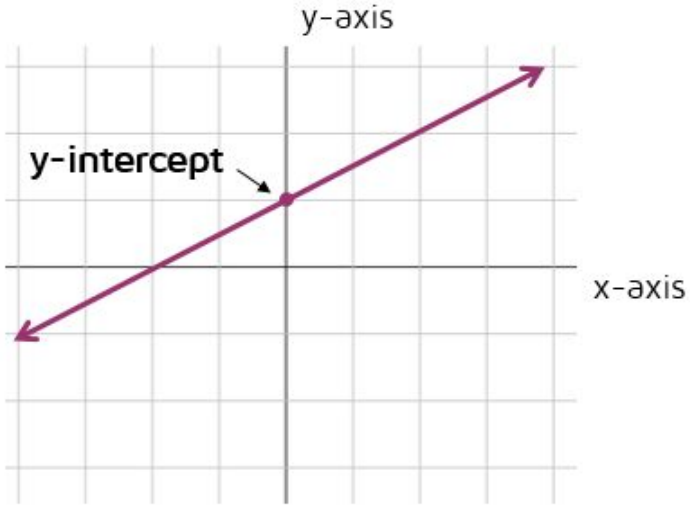


What is an Intercept?

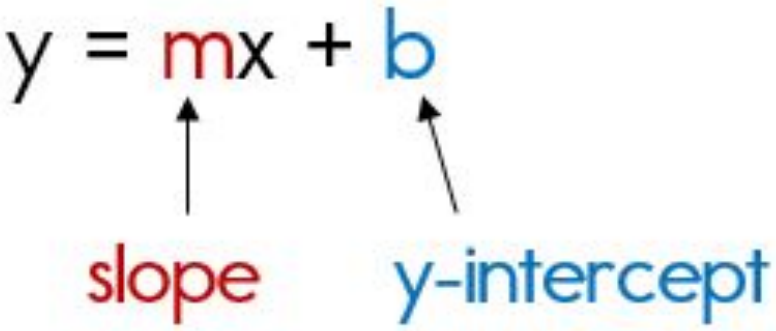
There are two axes on the coordinate plane: the x-axis and the y-axis.

When your line crosses one of those axes, it is called an intercept.

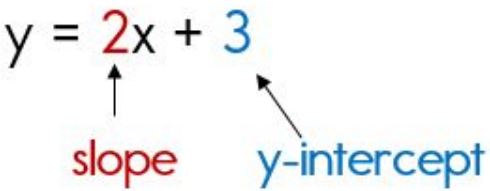
For slope-intercept form, we want to find the y - intercept: The point



Slope-Intercept Form Equation

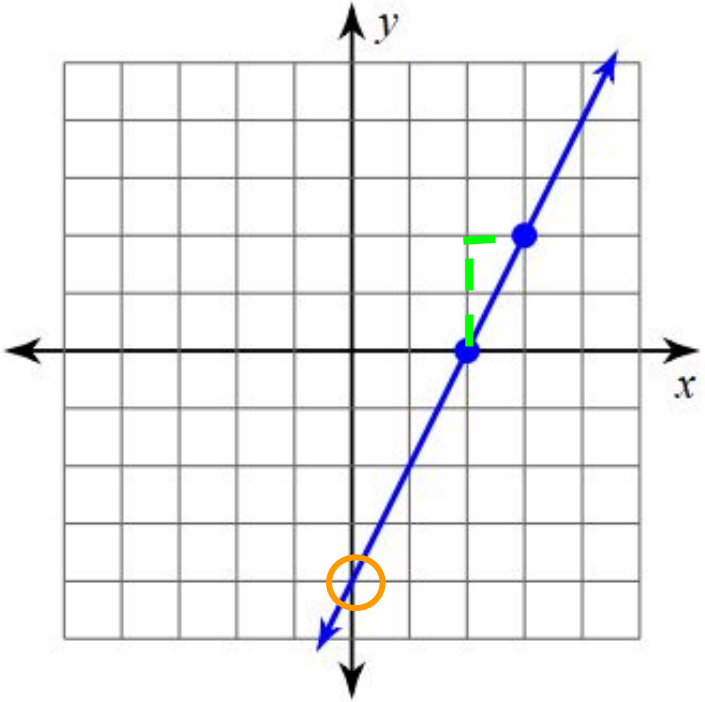


Example:



2/1 is the slope
(0,3) is the y-intercept

How To: Write an Equation of a Line *from a Graph*



① **Count the slope.**

For this line, we can use the two points given to find the slope is 2/1 or just 2

② **Find the y-intercept (where the line crosses the y-axis).**

For this line, we can see it crosses the y-axis where the orange circle is: at (0,–4).

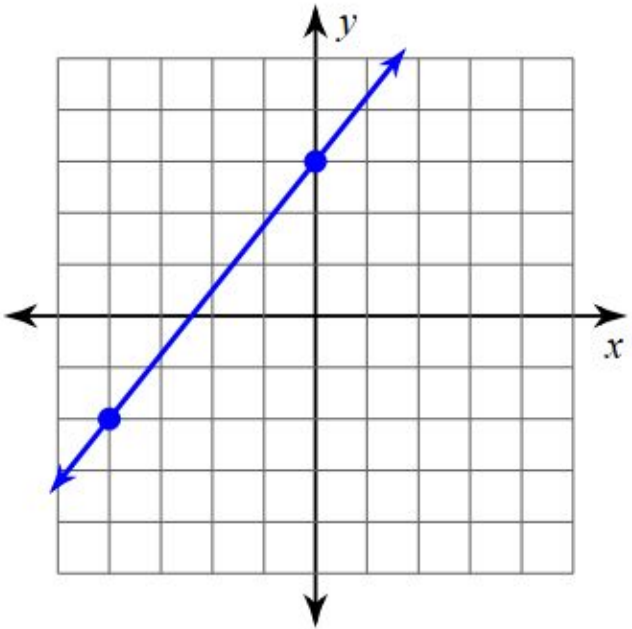
③ **Write the equation in slope-intercept form.**

$y = 2x - 4$

You can check that your equation is correct by plugging in any point on the line into the equation. For example, we can plug in the point (1, –2) using x=1 and y=–2.
So: –2 = 2(1) – 4, and –2 = –2 ★

Example 1:

Write the equation of the line.



① Count the **slope**.

$\frac{5}{4}$

② Find the **y-intercept**.

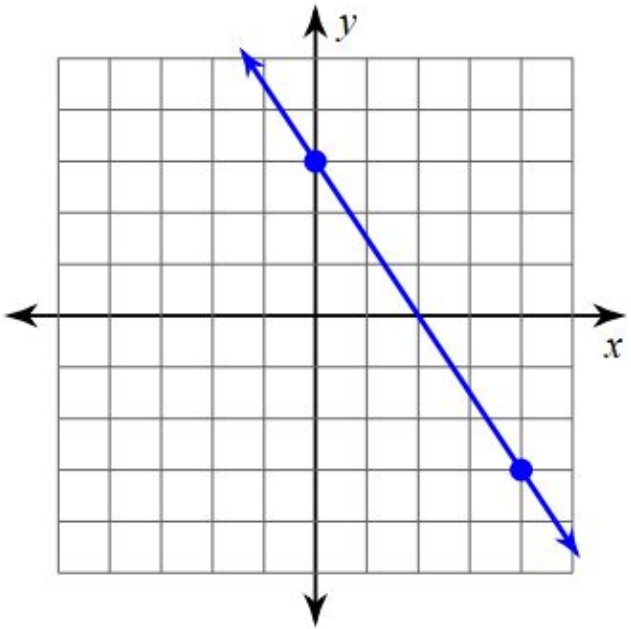
(0,3)

③ Write the **equation** in **slope-intercept form**.

$y = \frac{5}{4}x + 3$

Example 2:

Write the equation of the line.



① Count the **slope**.

$$\frac{-6}{4} = \frac{-3}{2}$$

② Find the **y-intercept**.

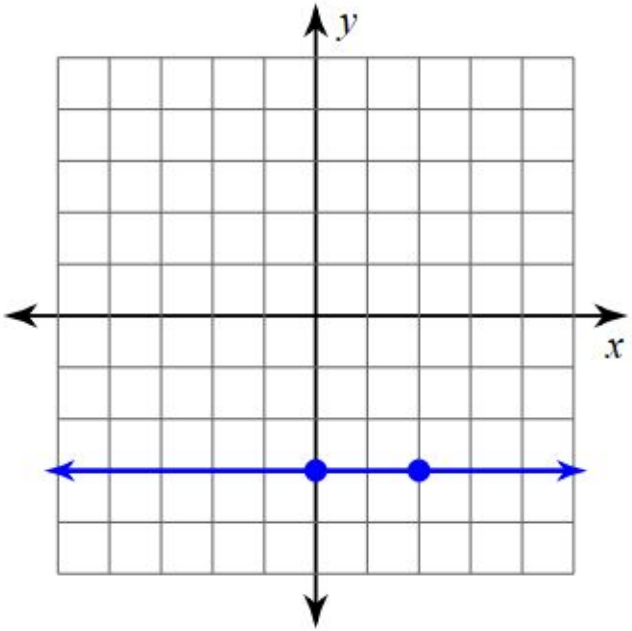
(0,3)

③ Write the **equation** in **slope-intercept form**.

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

Example 3:

Write the equation of the line.



① **Count the slope.**

0

② **Find the y-intercept.**

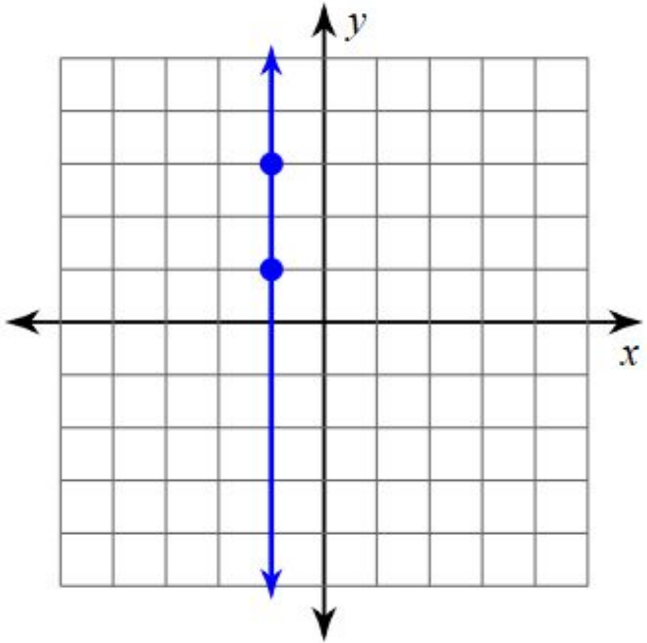
(0, –3)

③ **Write the equation in slope-intercept form.**

y = 0x – 3 *or* *y = – 3*

Example 4:

Write the equation of the line.



① **Count the slope.**

undefined

② **Find the y-intercept.**

There isn't one!

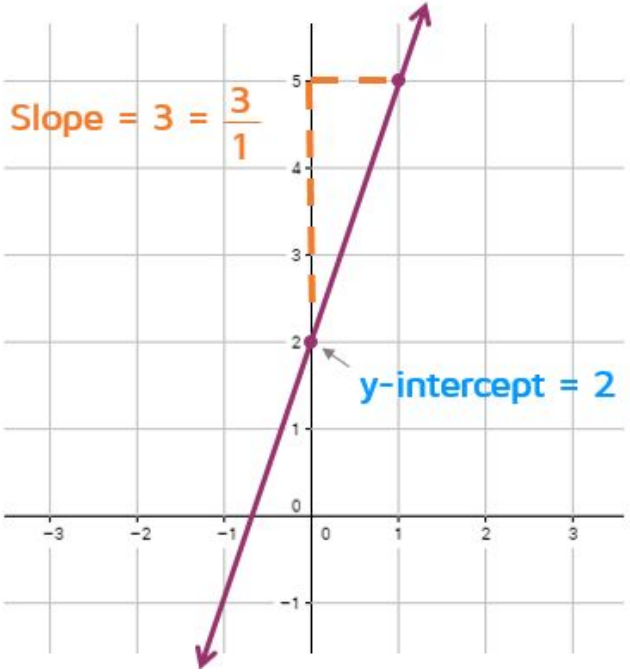
③ **Write the equation in slope-intercept form.**

This is a special case. Because there is not a y-intercept, we can't put it in slope-intercept form. However, it does have an x-intercept at (– 1, 0). The equation for this undefined line looks like:

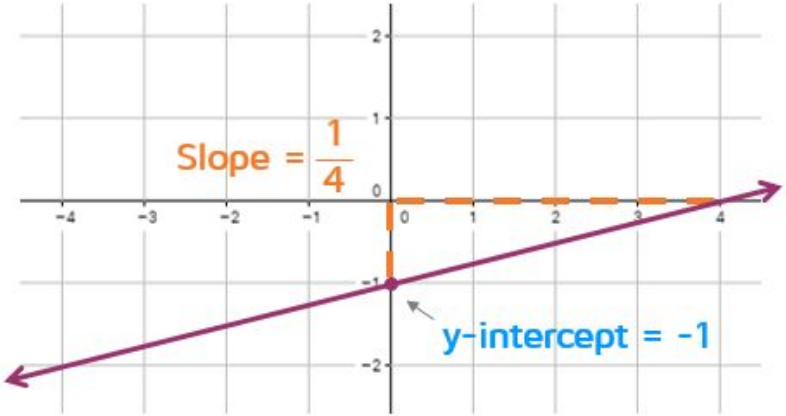
$x = -1$

Take a Look at This:

Graph of $y = 3x + 2$



Graph of $y = \frac{1}{4}x - 1$



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

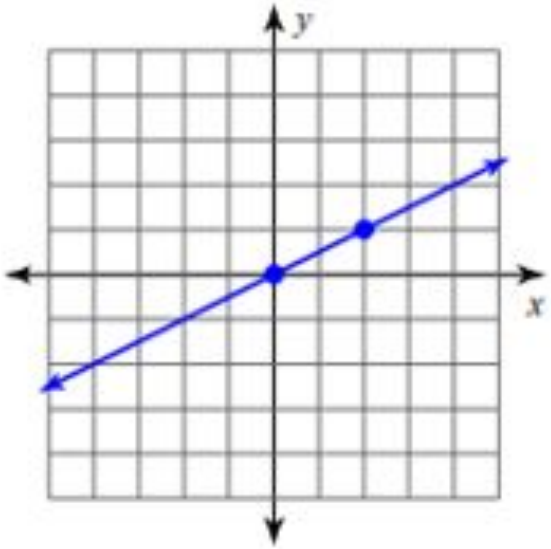
slope y-intercept

Practice 1:

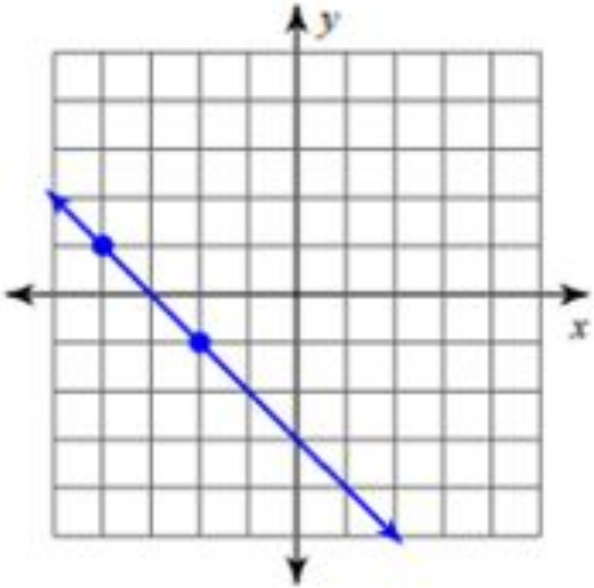
Answers on next slide

Write the equation for each line in slope-intercept form.

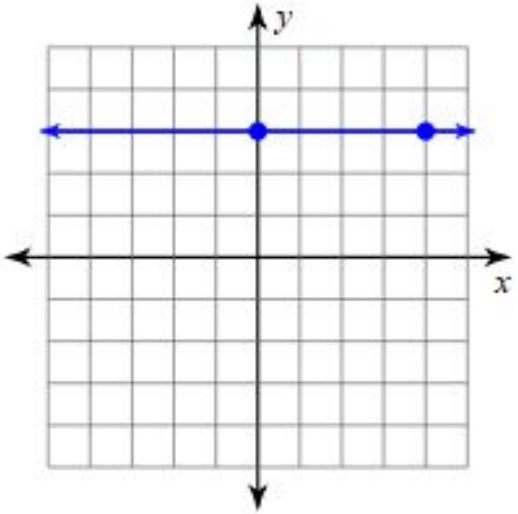
①



②



③



Practice 1: *Answer Key*

① $y = \frac{1}{2}x + 0$

or

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

② $y = -1x - 3$

or

$y = -x - 3$

③ $y = 0x + 3$

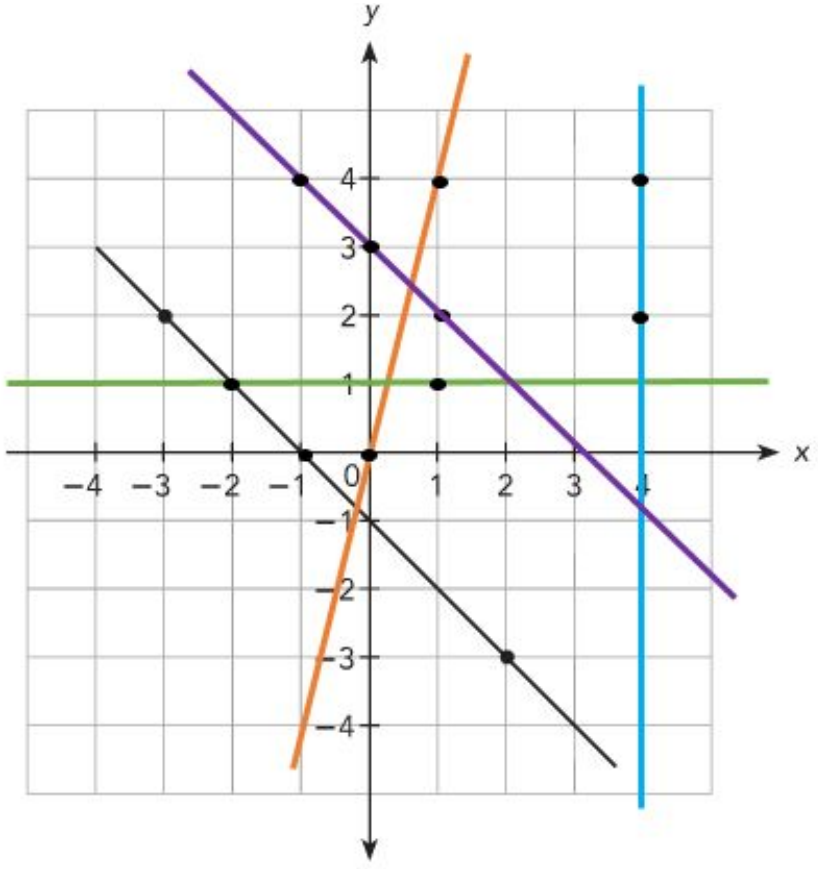
or

$y = 3$

Practice 2:

Answers on next slide

Write an equation for <u>each</u> of the lines below.



Exit Ticket: *Answer Key*

Orange Line: $y = 4x + 0$ *or* $y = 4x$

Black Line: $y = -1x - 1$ *or* $y = -x - 1$

Purple Line: $y = -1x + 3$ *or* $y = -x + 3$

Blue Line: $x = 4$

Green Line: $y = 0x + 1$ *or* $y = 1$

Additional Resources:

Slope Intercept from Two Points Practice

Y-intercept Practice

Slope-intercept form: write an equation from a graph

Slope of a Line from a Graph