$y = mx + b$ — slope: $\frac{\Delta y}{\Delta x}$ — y-intercept $(0, b)$

Lesson 20: Every Line Is a Graph of a Linear Equation

has an

Classwork

Opening Exercise

Figure 1

$y = mx + b$

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

start at $(0, -3)$

then go up 2 right 3

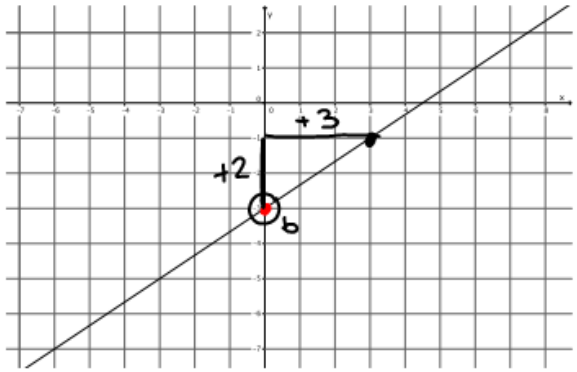


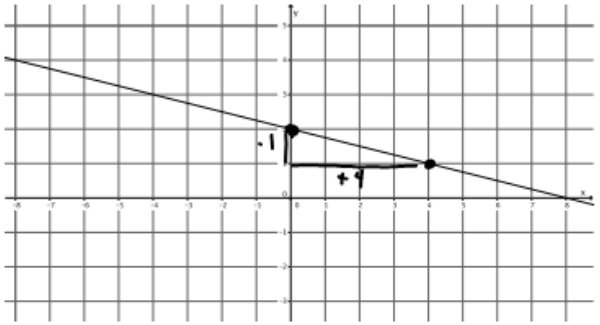
Figure 2

start at $(0, 2)$

then go down 1 right 4

$y = mx + b$

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

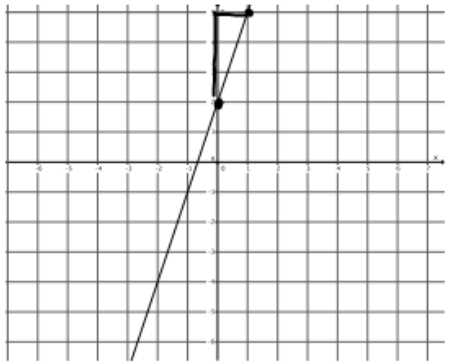


Exercises

1. Write the equation that represents the line shown.

start at (0, 2)
then go up 3 right 1

$y = 3x + 2$

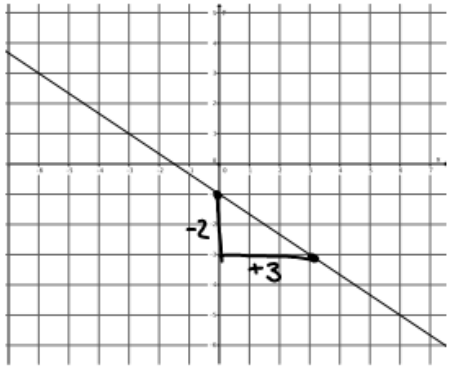


Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.

2. Write the equation that represents the line shown.

start at (0, −1)
then go down 2 right 3

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



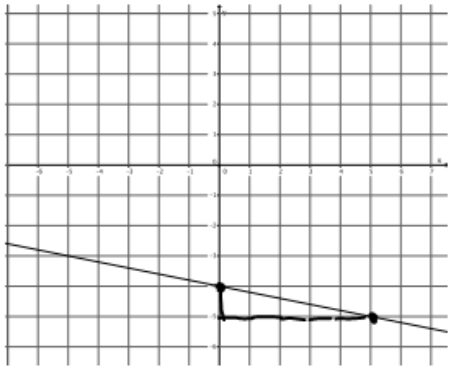
Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.

3. Write the equation that represents the line shown.

start at (0, -4)
then go down 1 / right 5

$y = -\frac{1}{5}x - 4$

Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.

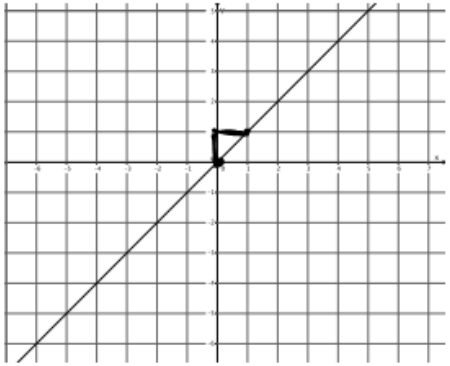


4. Write the equation that represents the line shown.

start at (0, 0)
then go up 1 / right 1

$y = x$

Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.

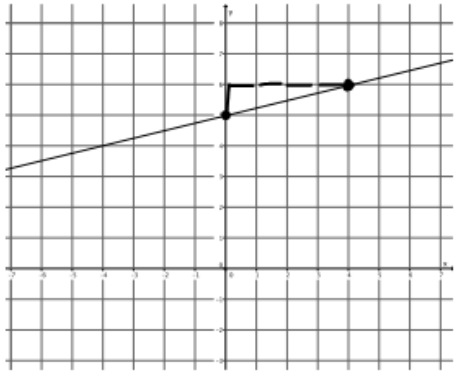


5. Write the equation that represents the line shown.

start at (0, 5)
then go $\frac{\text{up } 1}{\text{right } 4}$

$y = \frac{1}{4}x + 5$

Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.

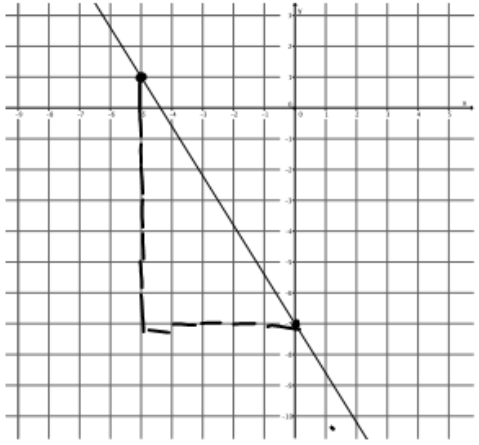


6. Write the equation that represents the line shown.

start at (0, -7)
then go $\frac{\text{down } 8}{\text{right } 5}$

$y = -\frac{8}{5}x - 7$

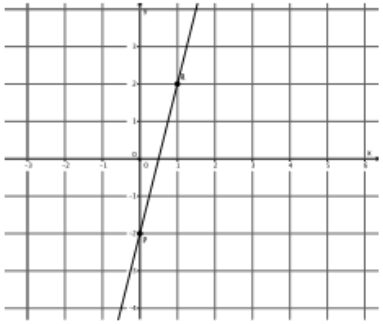
Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.



Lesson Summary

Write the equation of a line by determining the y-intercept, $(0, b)$ and the slope, m, and replacing the numbers b and m into the equation $y = mx + b$.

Example:



The y-intercept of this graph is $(0, -2)$.

The slope of this graph is $m = \frac{4}{1} = 4$.

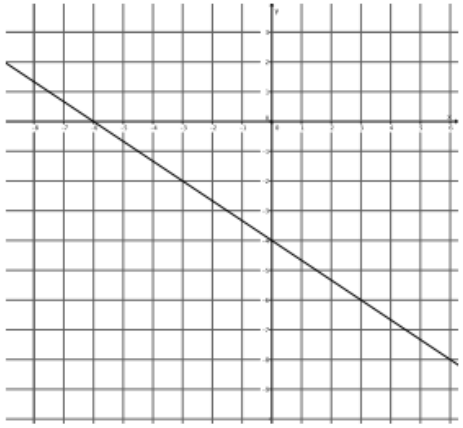
The equation that represents the graph of this line is $y = 4x - 2$.

Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers and a is not negative.

Problem Set

1. Write the equation that represents the line shown.

   Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.



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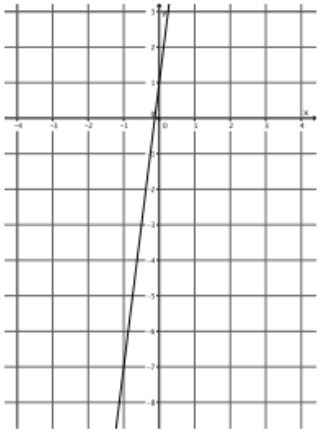

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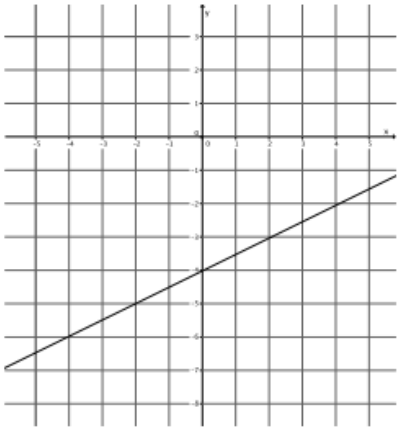
   Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.



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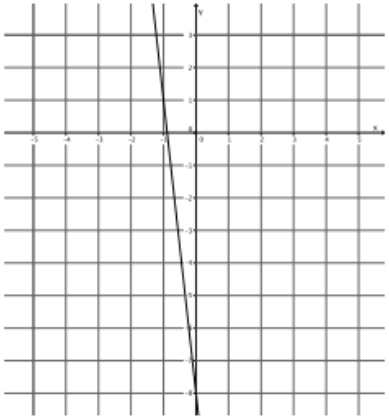

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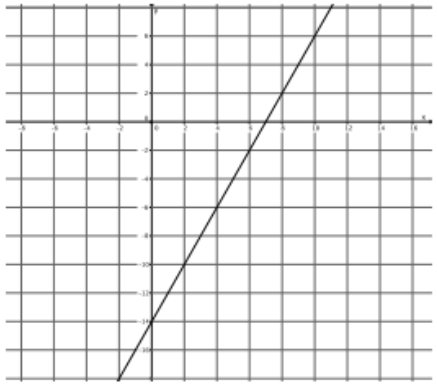
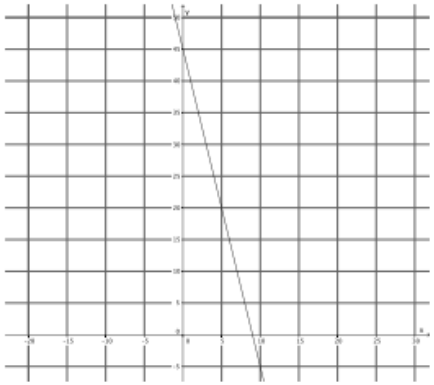


Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.

6. Write the equation that represents the line shown.



Use the properties of equality to change the equation from slope-intercept form, $y = mx + b$, to standard form, $ax + by = c$, where a, b, and c are integers, and a is not negative.