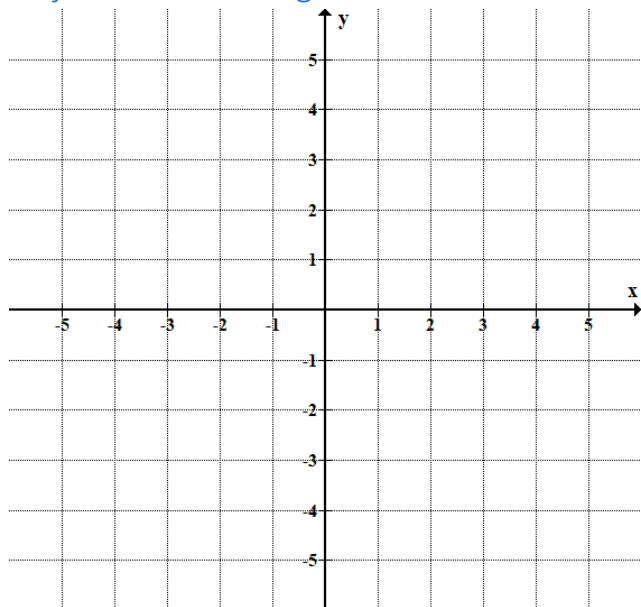


Graphing Linear Equations

Objective 1: Plotting Ordered Pairs on a Rectangular Coordinate System



x – axis: horizontal number line

y – axis: vertical number line

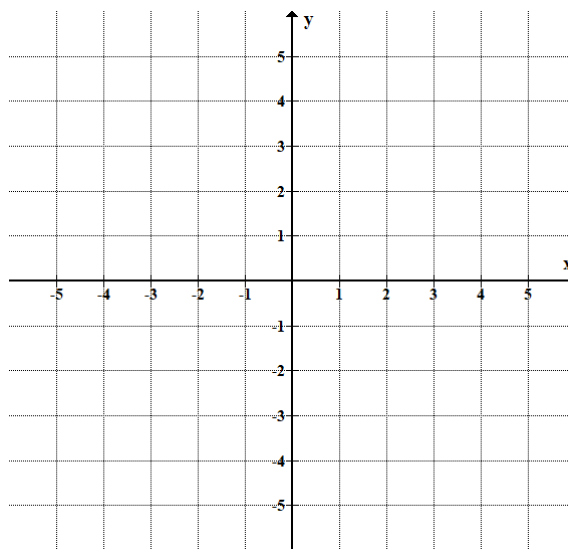
Origin: the point of intersection of the two axes

Quadrants: four regions created by the intersection of the two axes

Ordered pair (x, y) – two numbers associated with a point on a graph. The first number gives the horizontal location of the point. The second gives the vertical location.

Example: Plot each ordered pair. State in which quadrant, or on which axis the points lie. Label each point on the graph.

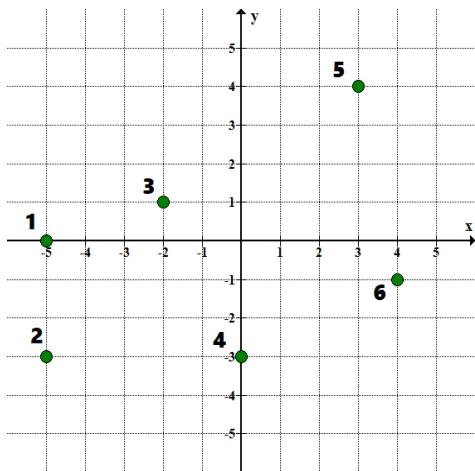
- A. $(3, 2)$ _____
- B. $(-4, -2)$ _____
- C. $(2, -1)$ _____
- D. $(0, 5)$ _____
- E. $(4, 0)$ _____



Pause the video to try this one on your own, then restart when you are ready to check your answer.

Extra Practice

Determine the coordinates of the point indicated, and the quadrant or axis that they lie in(on).



Restart when you are ready to check your answers.

Objective 2: Graph Linear Equations by Using a Table

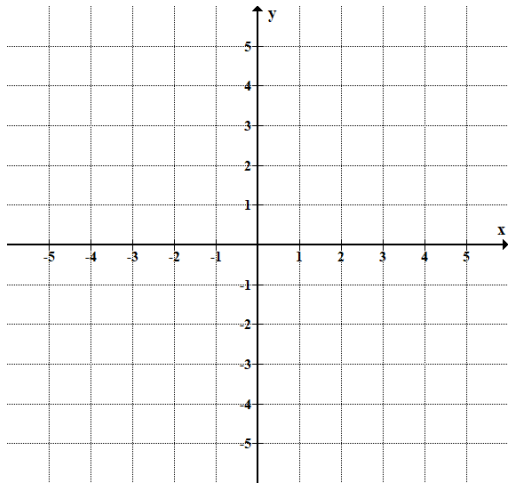
Linear equation in two variables: $Ax + By = C$, where A, B and C are real numbers.

Solutions are ordered pairs that satisfy the equation.

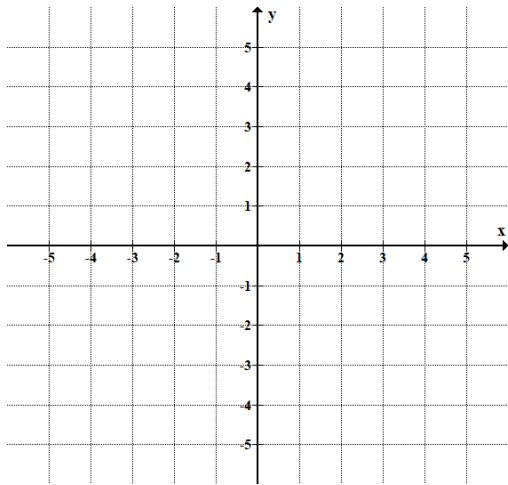
Example: Determine if the following ordered pairs are solutions to $3x - 2y = 8$.

- a) (6, 5)
- b) (4, -2)
- c) (0, -4)

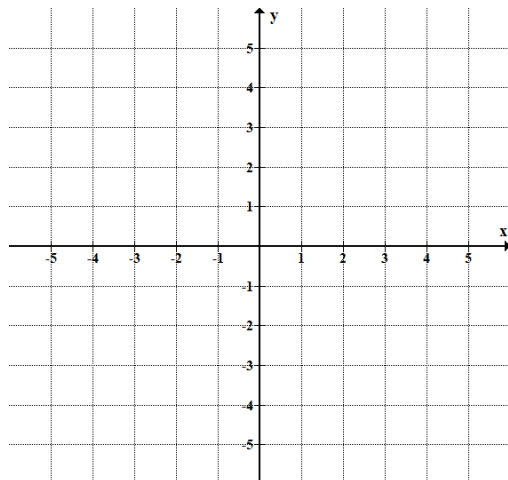
Example: Graph the following equation: $y = 3x + 1$



Example: Graph the following equation: $y = -\frac{3}{5}x + 4$



Example: Graph the following equation: $2x - 3y = 6$

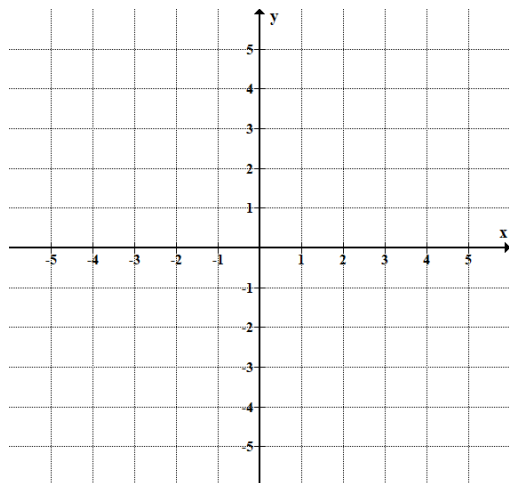


Pause the video to try this one on your own, then restart when you are ready to check your answer.

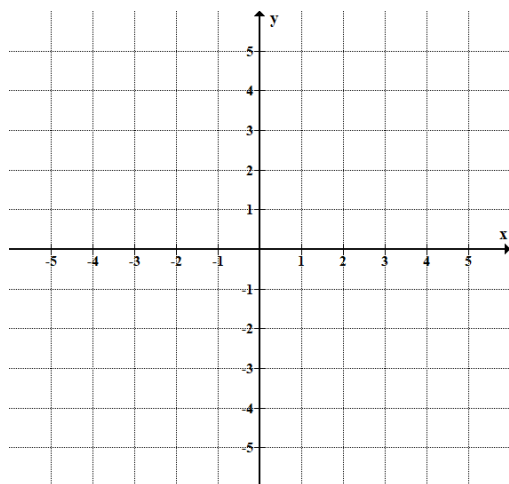
Extra Practice

Graph the following equations using a table of values.

1. $y = 4x + 1$



2. $5x - 3y = 6$



Restart when you are ready to check your answers.

Objective 3: Graph Linear Equations Using the x-and-y Intercepts

The **x-intercept** is the point at which the graph crosses the _____.

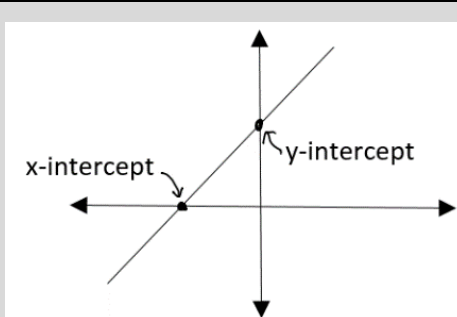
To find x-intercept, let $y = \underline{\hspace{2cm}}$ and solve for _____.

It is written in the form _____.

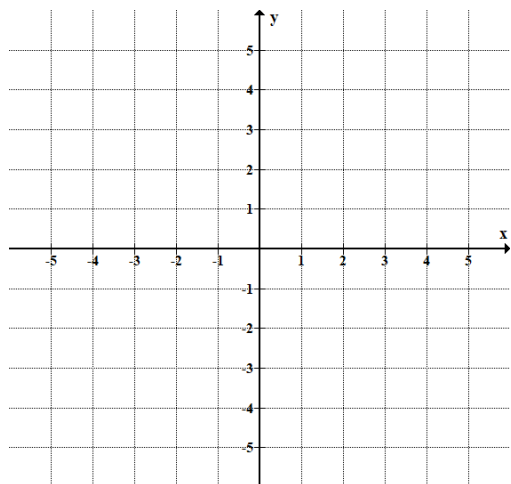
The **y-intercept** is the point at which the graph crosses the _____.

To find y-intercept, let $x = \underline{\hspace{2cm}}$ and solve for _____.

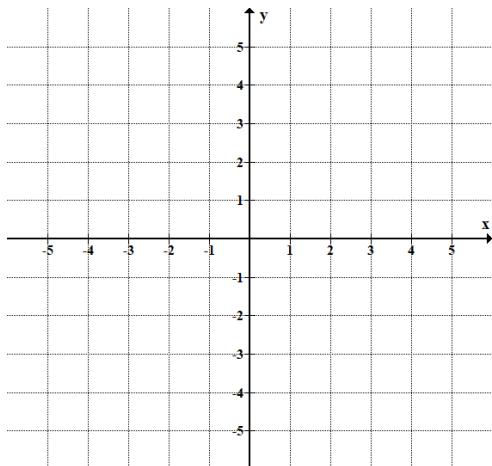
It is written in the form _____.



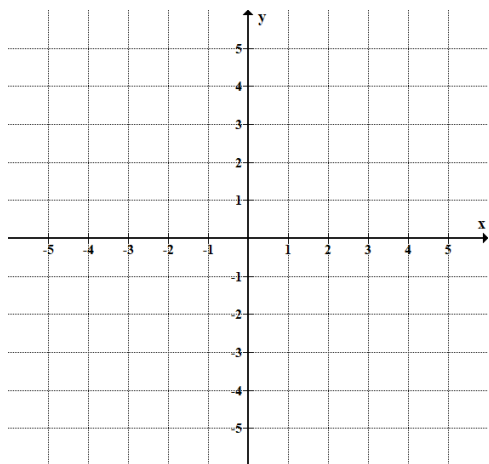
Example: Graph $5x + 10y = 10$ by using the x-and-y intercepts.



Example: Graph $2x - 4y = 12$ by using the x-and-y intercepts.



Example: Graph $y = 4x - 3$ by using the x-and-y intercepts.

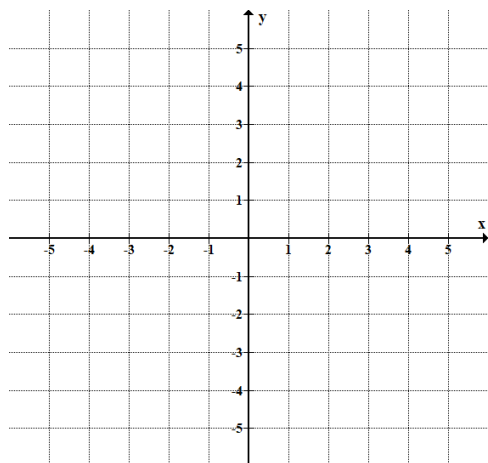


Pause the video to try this one on your own, then restart when you are ready to check your answer.

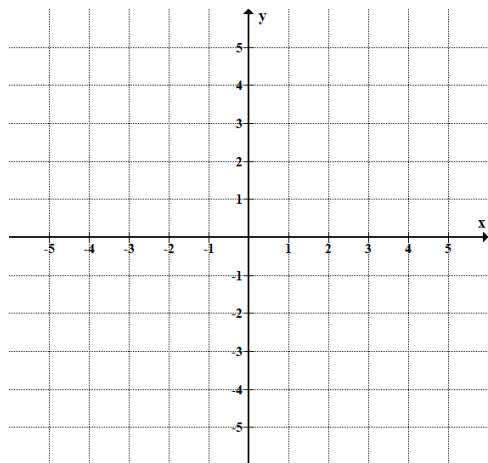
Extra Practice

Graph using x-and y- intercepts.

1. $-4x + 2y = 8$



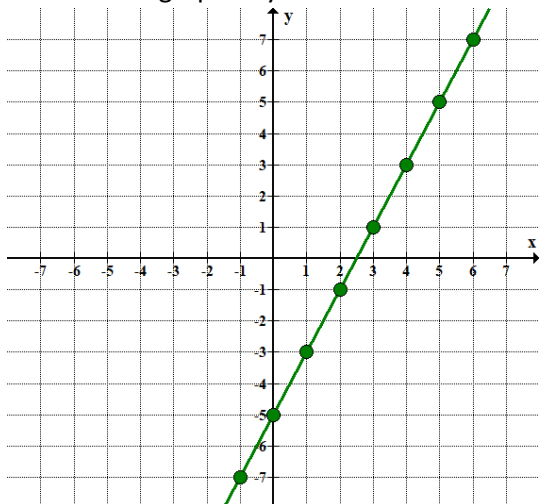
2. $y = 2x - 5$



Restart when you are ready to check your answers.

Objective 4: Slope of a Line

Below is the graph of $y = 2x - 5$.



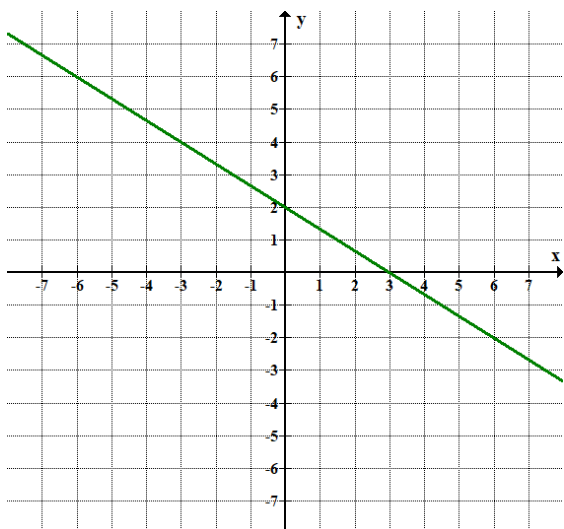
Lines have constant slope. Slope is a measure of the steepness of the line.

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

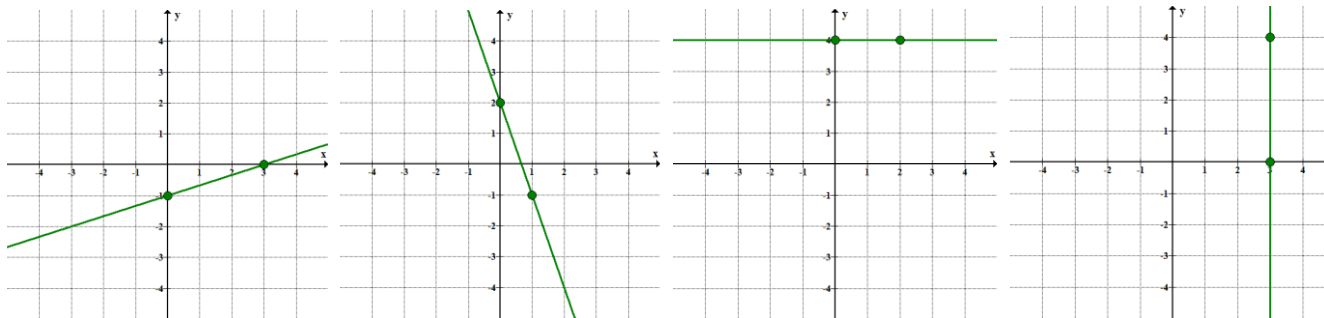
Example: Find the slope of the line through (3,7) and (4,-2).

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

Example: Find the slope of the line graphed.



Example: Find the slope of each line graphed.



Lines that go up from left to right have positive slope.

Lines that go down from left to right have negative slope.

Horizontal lines have zero slope.

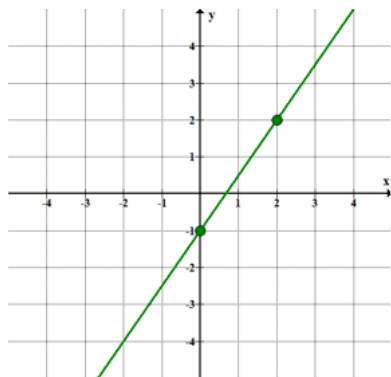
Vertical lines have undefined slope.

Pause the video to try this one on your own, then restart when you are ready to check your answer.

Extra Practice

1. Find the slope of the line through (5,7) and (-3,4).

2. Find the slope of the line graphed.



Restart when you are ready to check your answers.

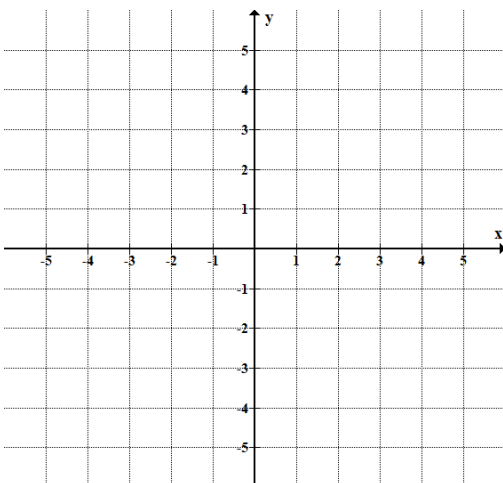
Objective 5: Graph Linear Equations Using the y-intercept and the Slope

Slope-intercept form of the equation of a line: $y = mx + b$
 m is the slope
 $(0, b)$ is the y-intercept

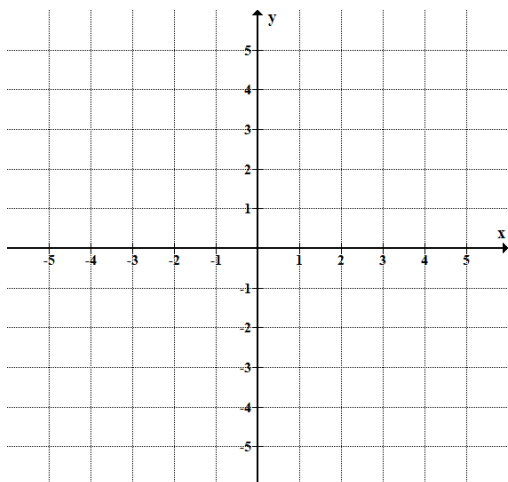
Example: Find the slope and the y-intercept of the line $3x - 6y = 12$.

Example: Find the slope and the y-intercept of the line $-3x + 5y = -15$.

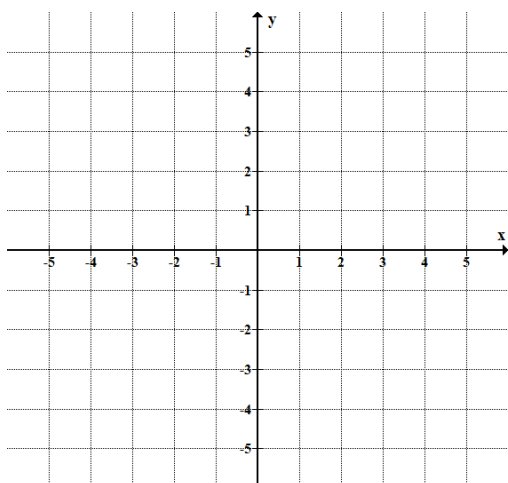
Example: Graph the equation $y = \frac{5}{3}x - 2$ using slope and y-intercept.



Example: Graph the equation $y = -\frac{3}{4}x + 2$ using slope and y-intercept.



Example: Graph the equation $6x - 3y = 9$ using slope and y-intercept.

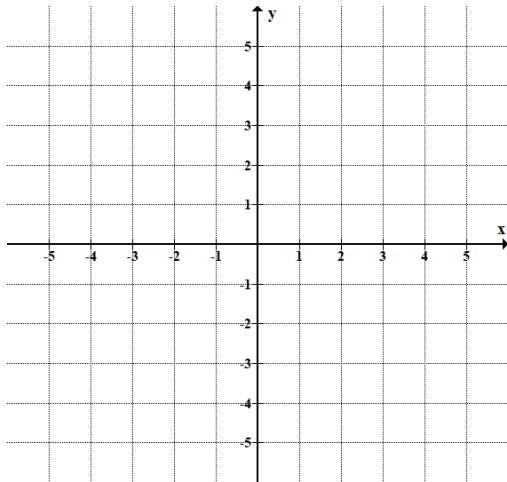


Pause the video to try this one on your own, then restart when you are ready to check your answer.

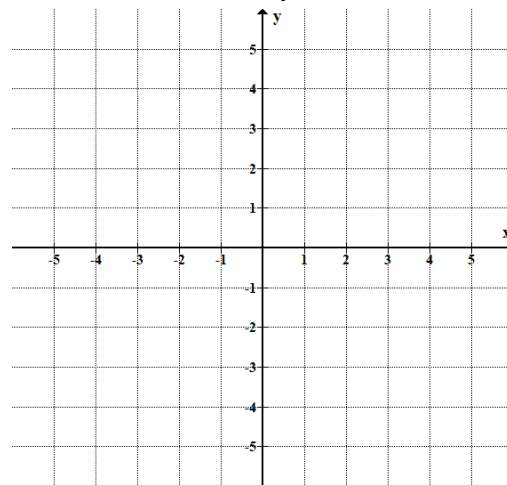
Extra Practice

1. Find the slope and y-intercept of the line $5x - 2y = 8$

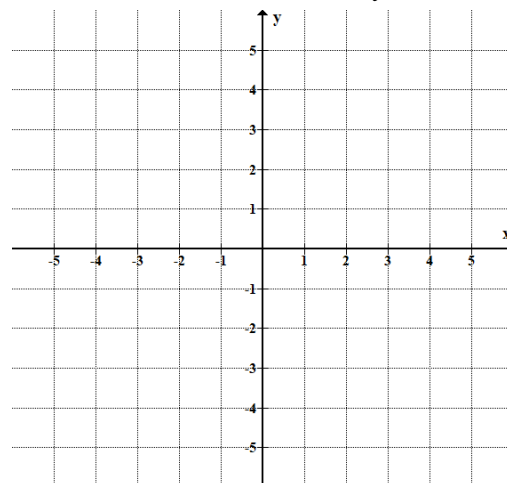
2. Graph the equation $y = -\frac{2}{3}x + 4$ using slope and y-intercept.



3. Graph the equation $y = 4x - 3$ using slope and y-intercept.



4. Graph the equation $5x + 3y = 6$ using slope and y-intercept.



Restart when you are ready to check your answers.

Objective 6: Graph Horizontal and Vertical Lines

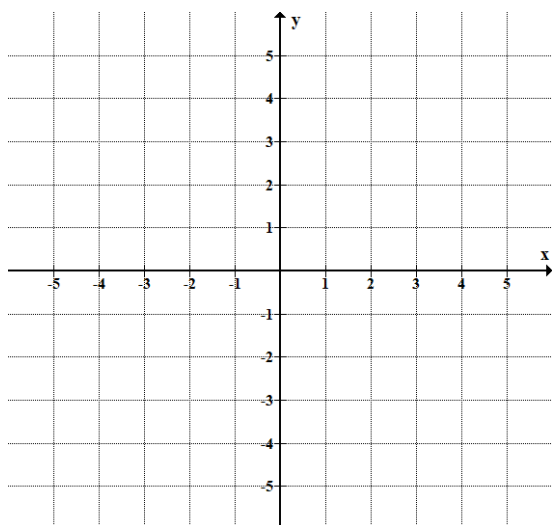
Horizontal Line

The equation of a horizontal line is in the form _____, where a is any number.

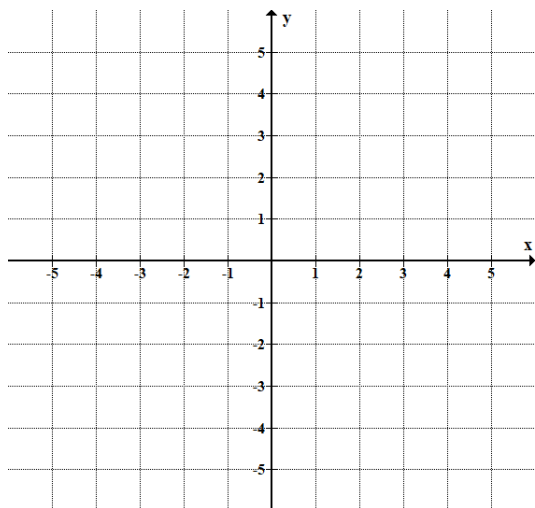
Vertical Line

The equation of a vertical line is in the form _____, where a is any number.

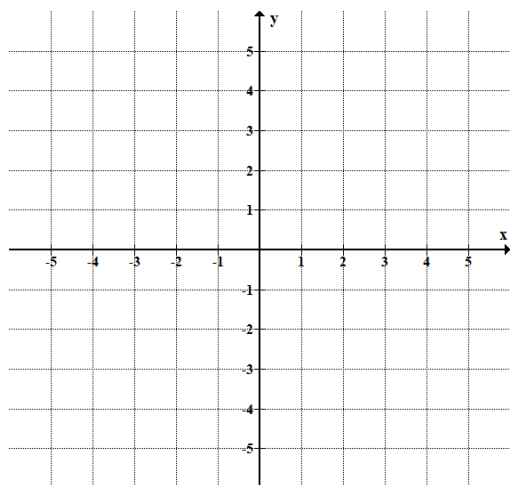
Example: Graph $y = 4$.



Example: Graph $x = -3$.



Example: Graph $y = 0$.

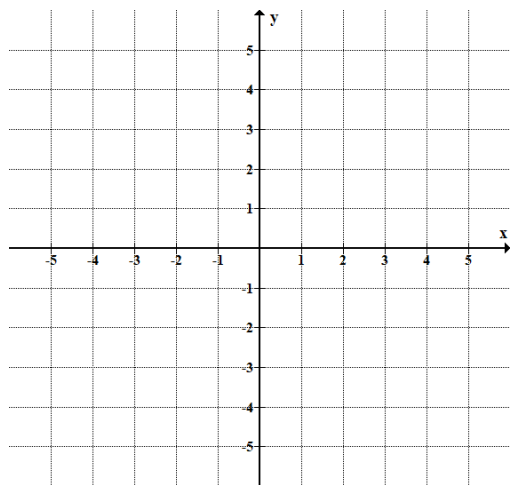


Pause the video to try this one on your own, then restart when you are ready to check your answer.

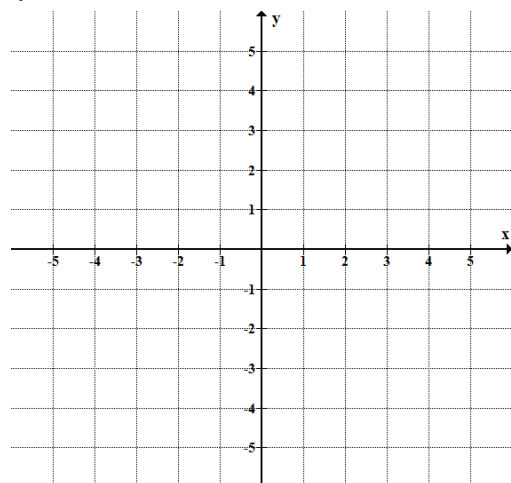
Extra Practice

Graph each of the following.

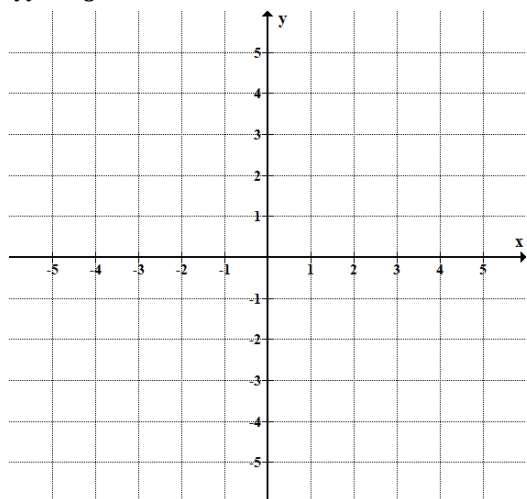
1. $x = 2$



2. $y = -3$



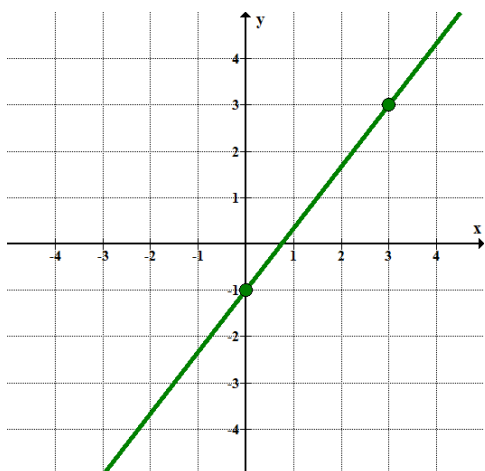
3. $x = 0$



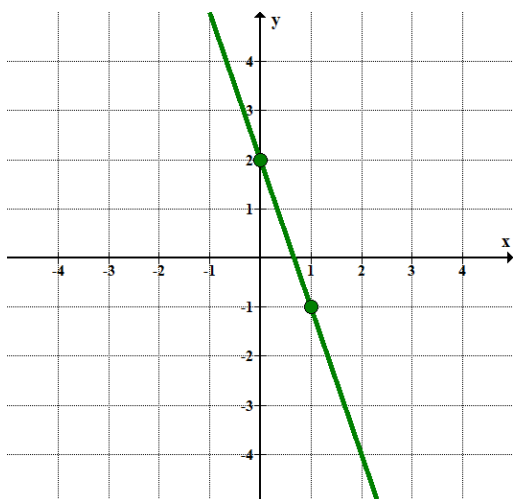
Restart when you are ready to check your answers.

Objective 7: Determine the Equation of a Line from the Graph

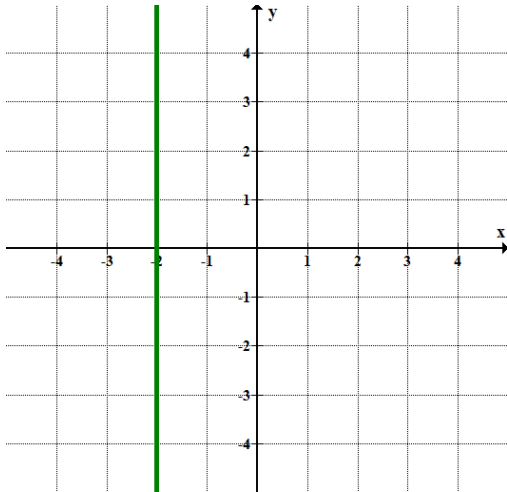
Example: Determine the equation of the line graphed.



Example: Determine the equation of the line graphed.



Example: Determine the equation of the line graphed.

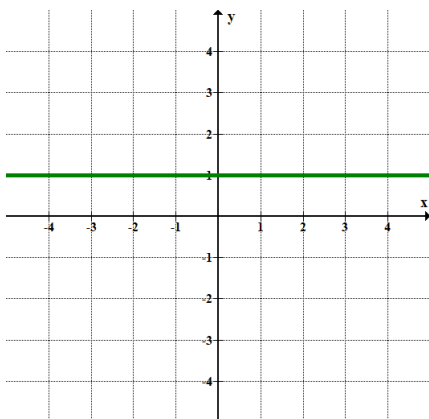


Pause the video to try this one on your own, then restart when you are ready to check your answer.

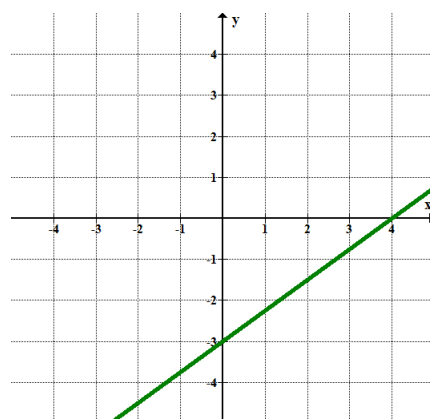
Extra Practice

Determine the equation of the line graphed.

1.



2.



Restart when you are ready to check your answers.