Graphs of Linear Equations

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Sauyo High School

How to Graph Linear Equations?

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1. Using two points

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2. Using the x- and y-intercepts

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Graphing linear equations can be done using any of these methods:

1. Using two points
2. Using the x- and y-intercepts
3. Using the slope and a point

How to Graph Linear Equations Using Two Points?

1. Assign any two values for x.

How to Graph Linear Equations Using Two Points?

1. Assign any two values for x.
2. Find the values for y to determine the ordered pairs of two points.

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1. Assign any two values for x.
2. Find the values for y to determine the ordered pairs of two points.
3. Plot the two points and connect them.

Example 1

Graph the equation $y = 2x + 1$.

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$\therefore$ the first ordered pair is (0, 1).

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$\therefore$ the second ordered pair is $(1, 3)$.

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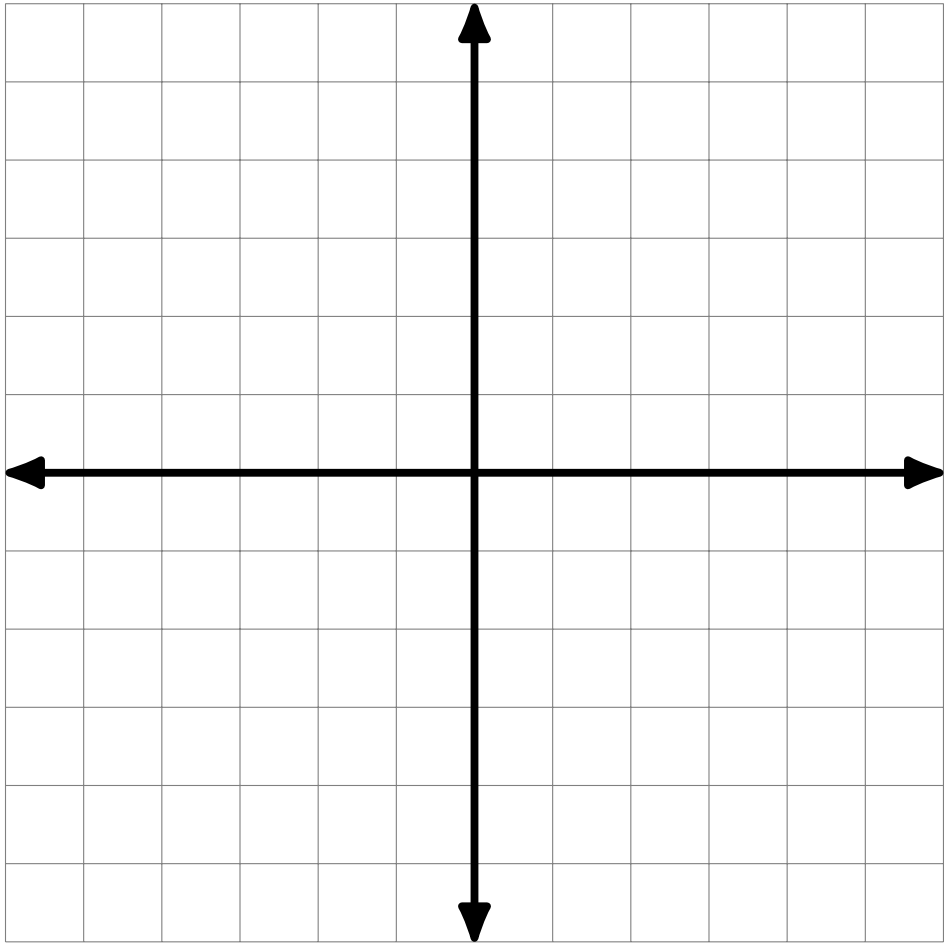
Example 1

Plot $(0, 1)$ and $(1, 3)$.



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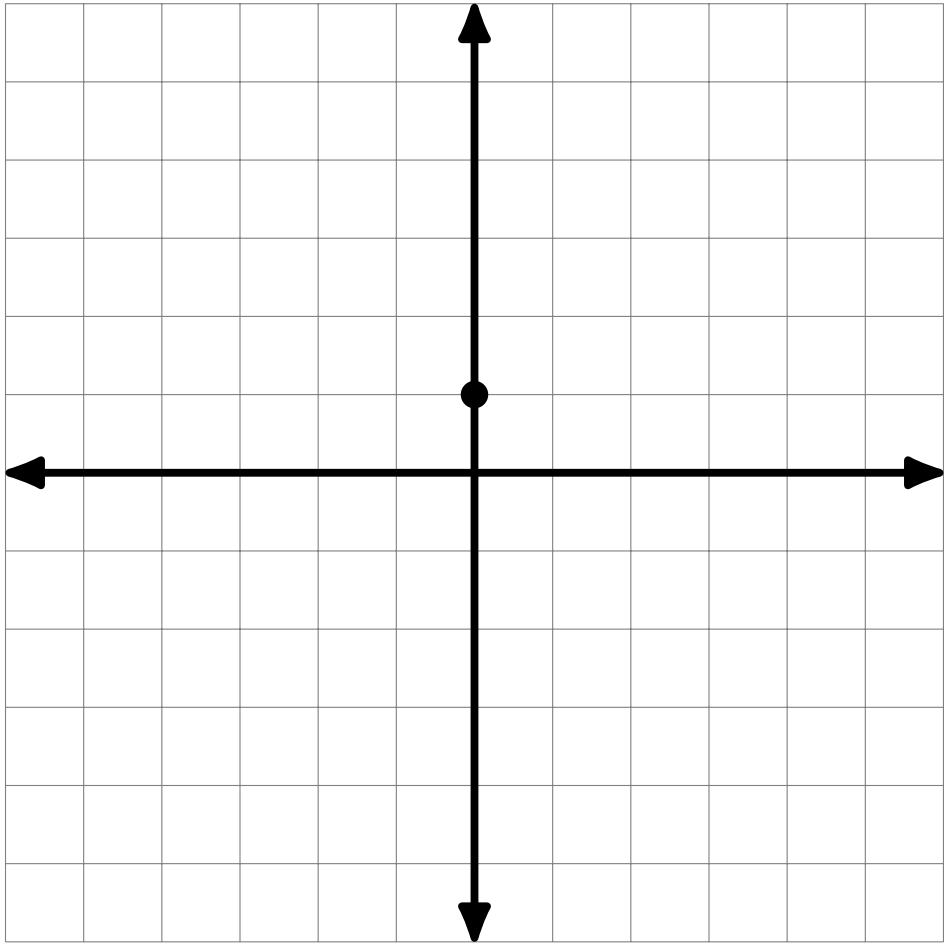

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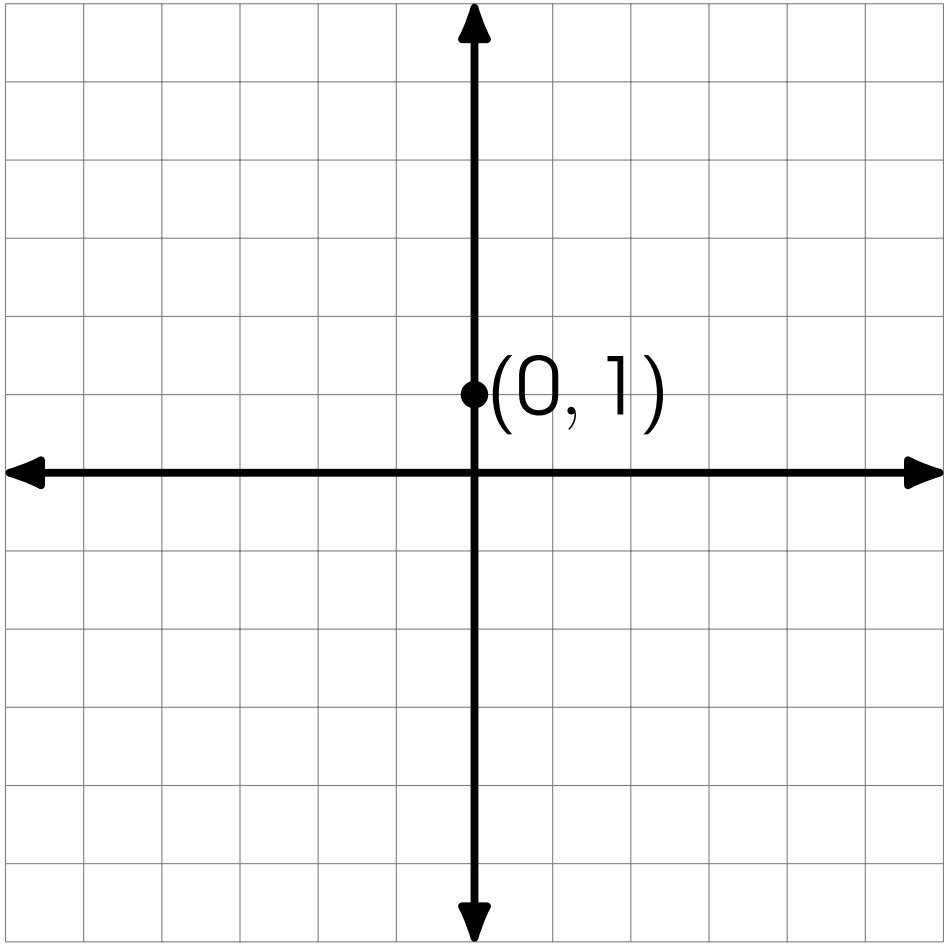

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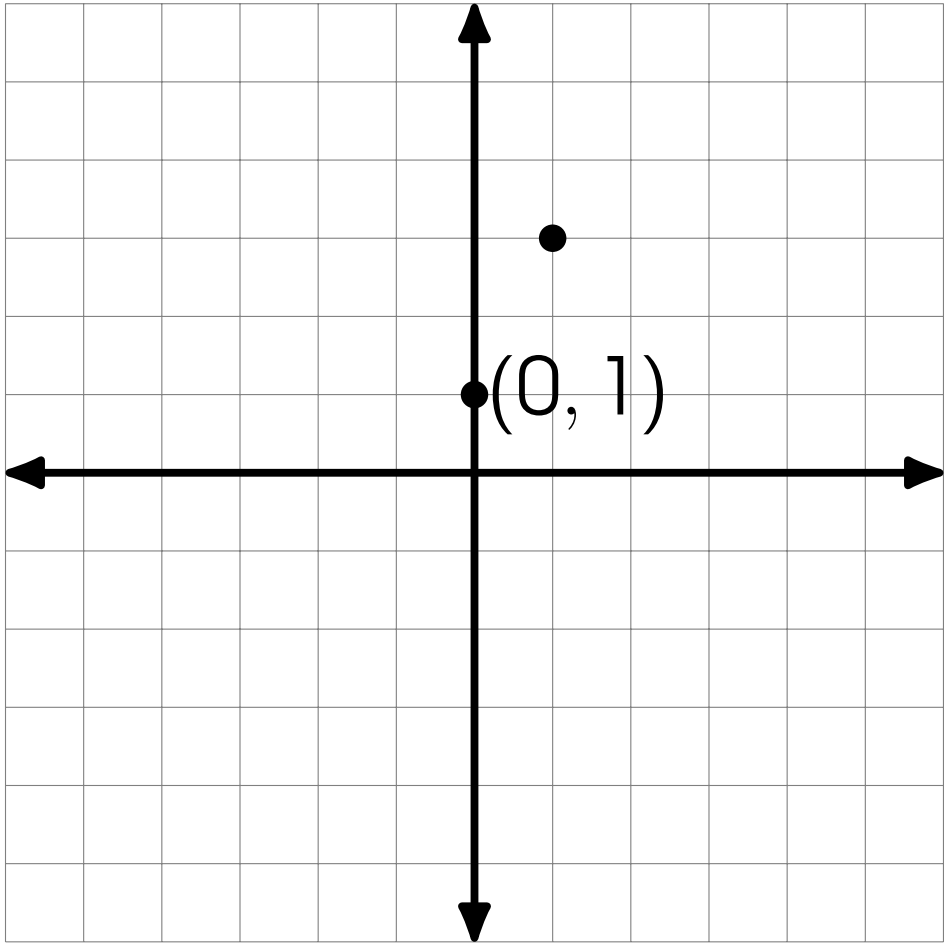

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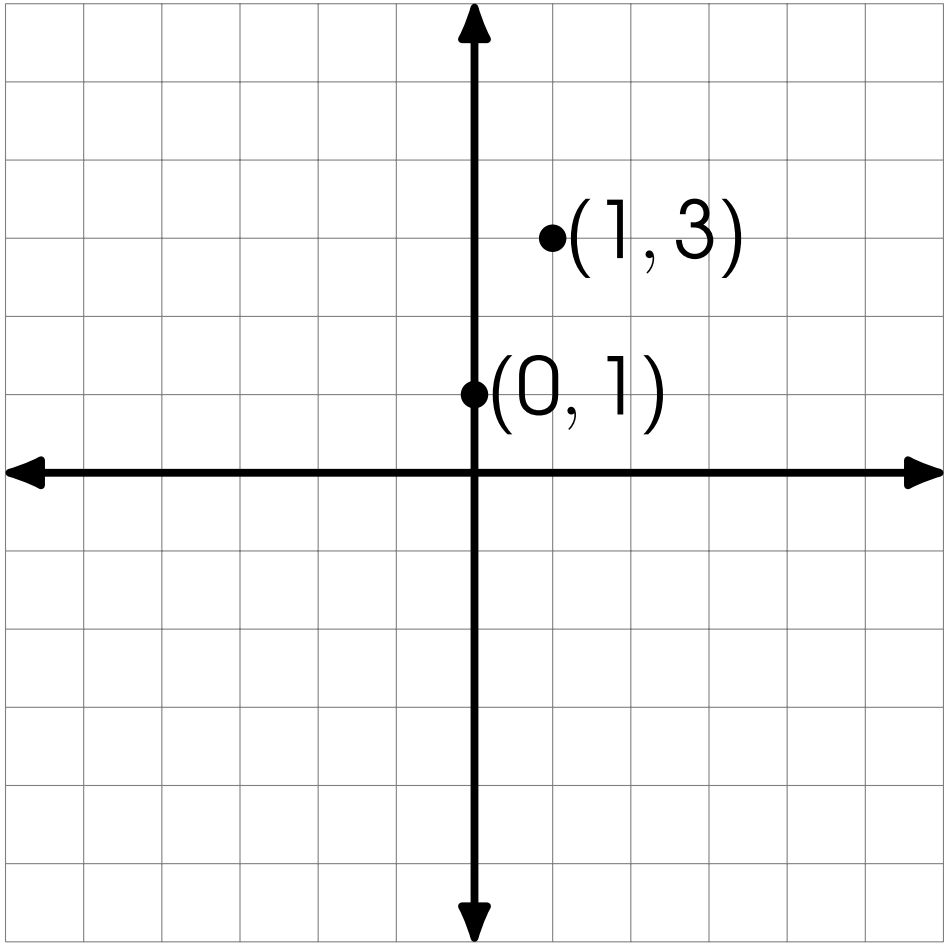

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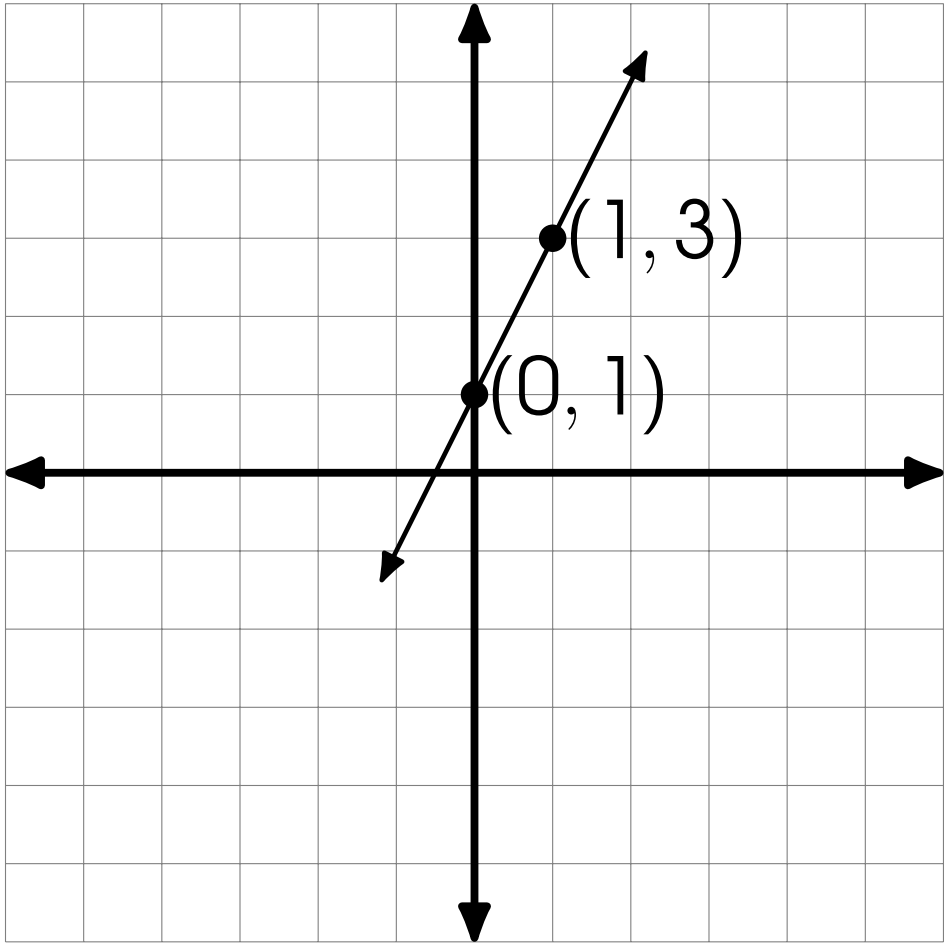

Example 2

Graph the equation $x + 2y = 6$.

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$2y = 8$	Simplification

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Graph the equation $x + 2y = 6$.

Let $x = -2$:

$$-2 + 2y = 6 \quad \text{Substitution Property}$$

$$2y = 6 + 2 \quad \text{Addition Property}$$

$$2y = 8 \quad \text{Simplification}$$

$$\frac{2y}{2} = \frac{8}{2}$$

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$y = 4$	Simplification

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$\therefore$ the first ordered pair is $(-2, 4)$.

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$\therefore$ the second ordered pair is $(2, 2)$.

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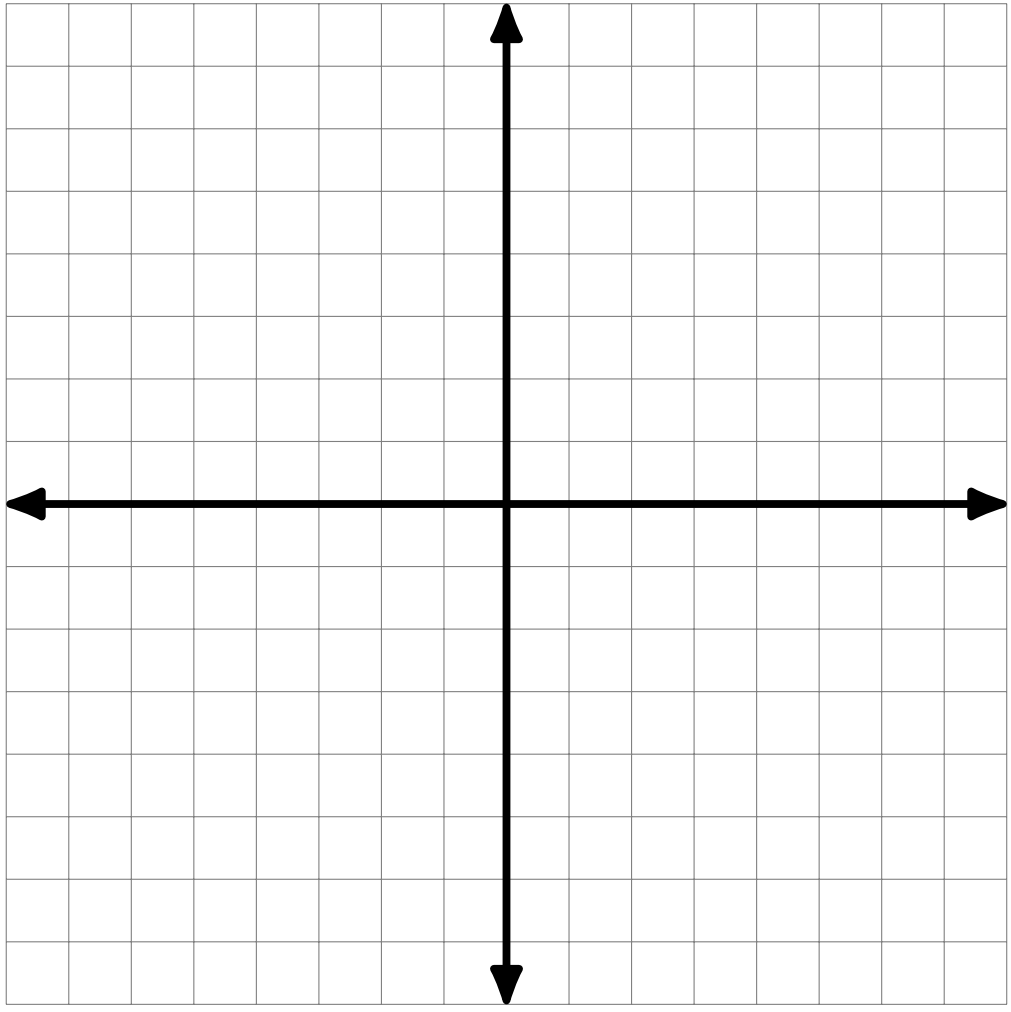

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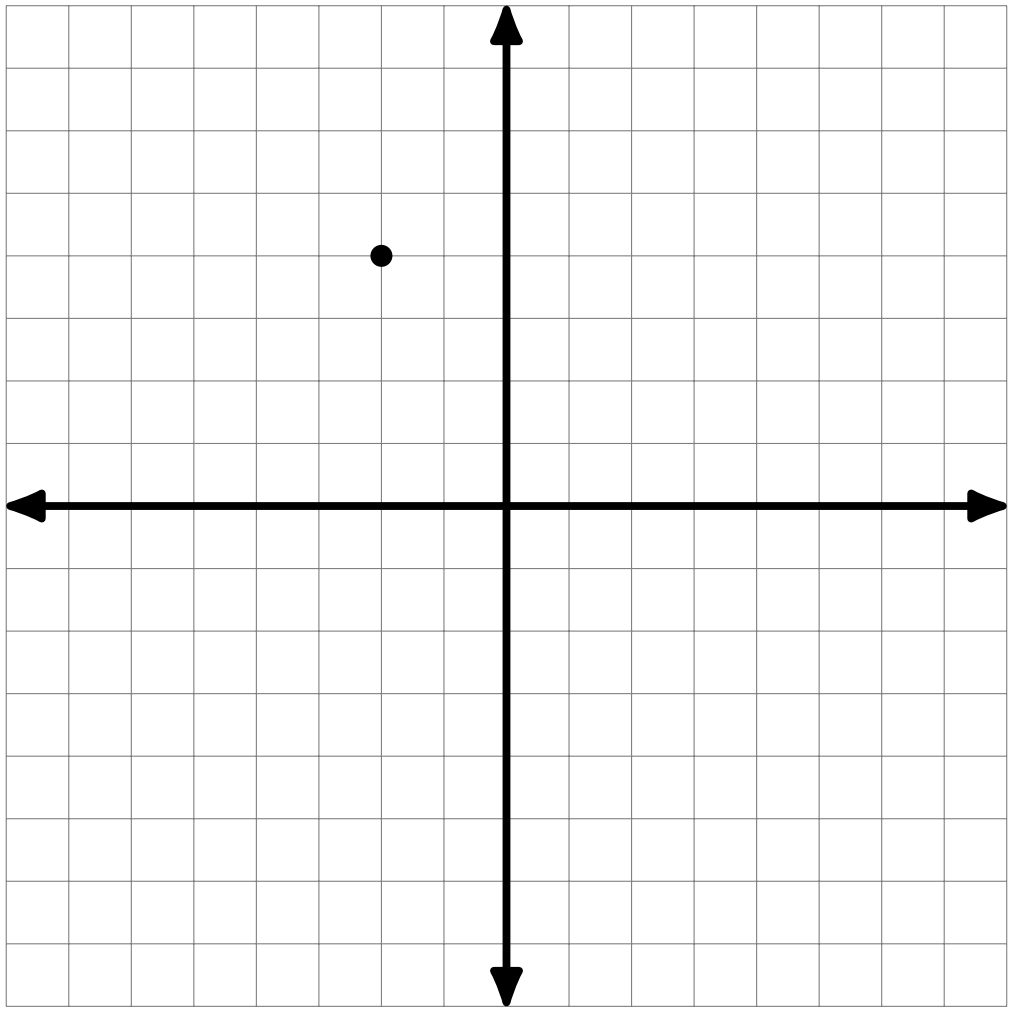

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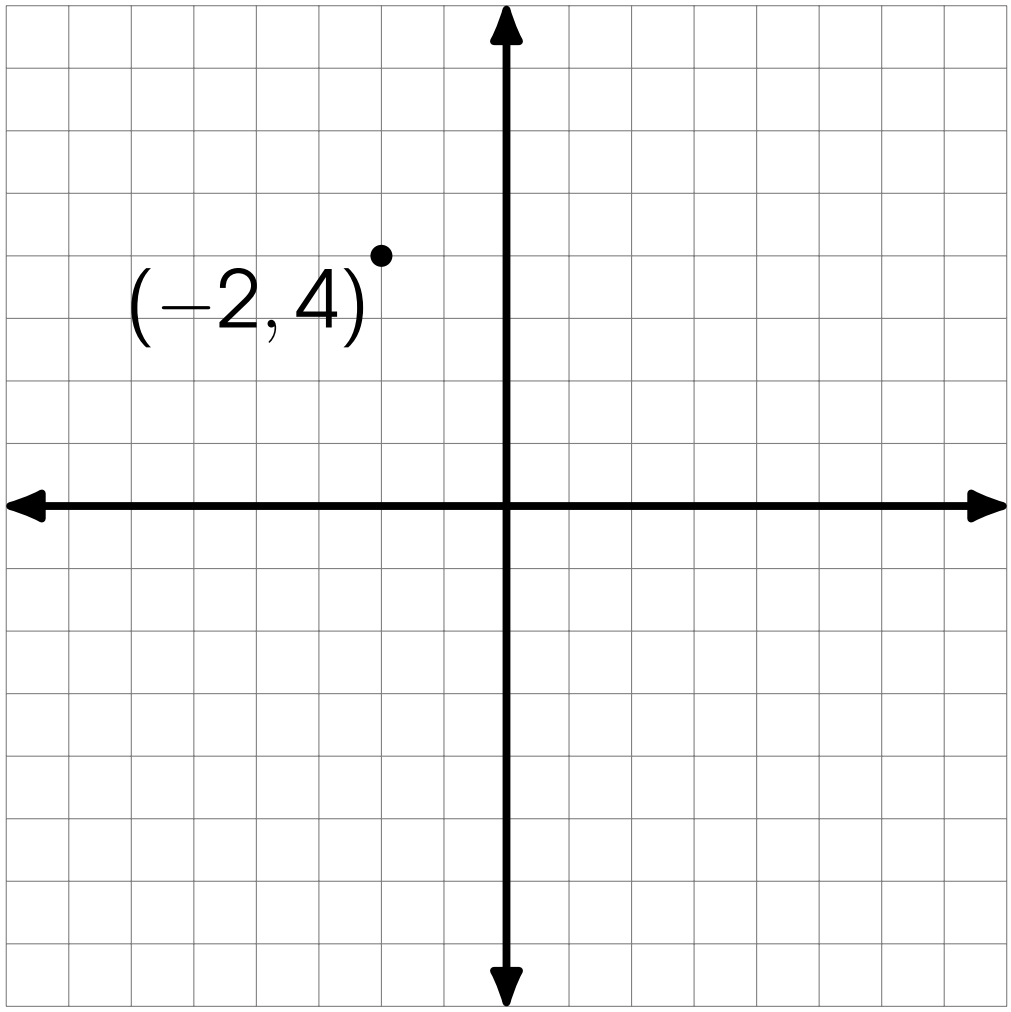

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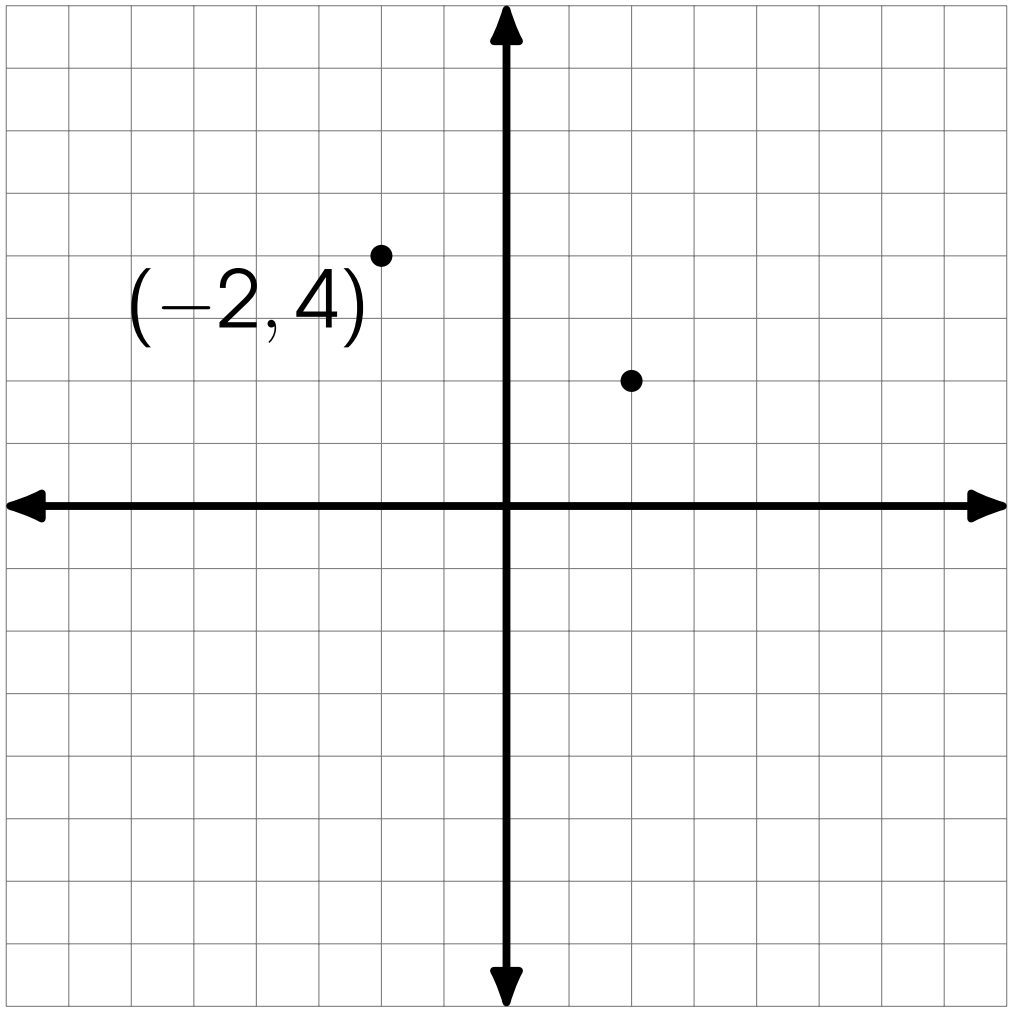

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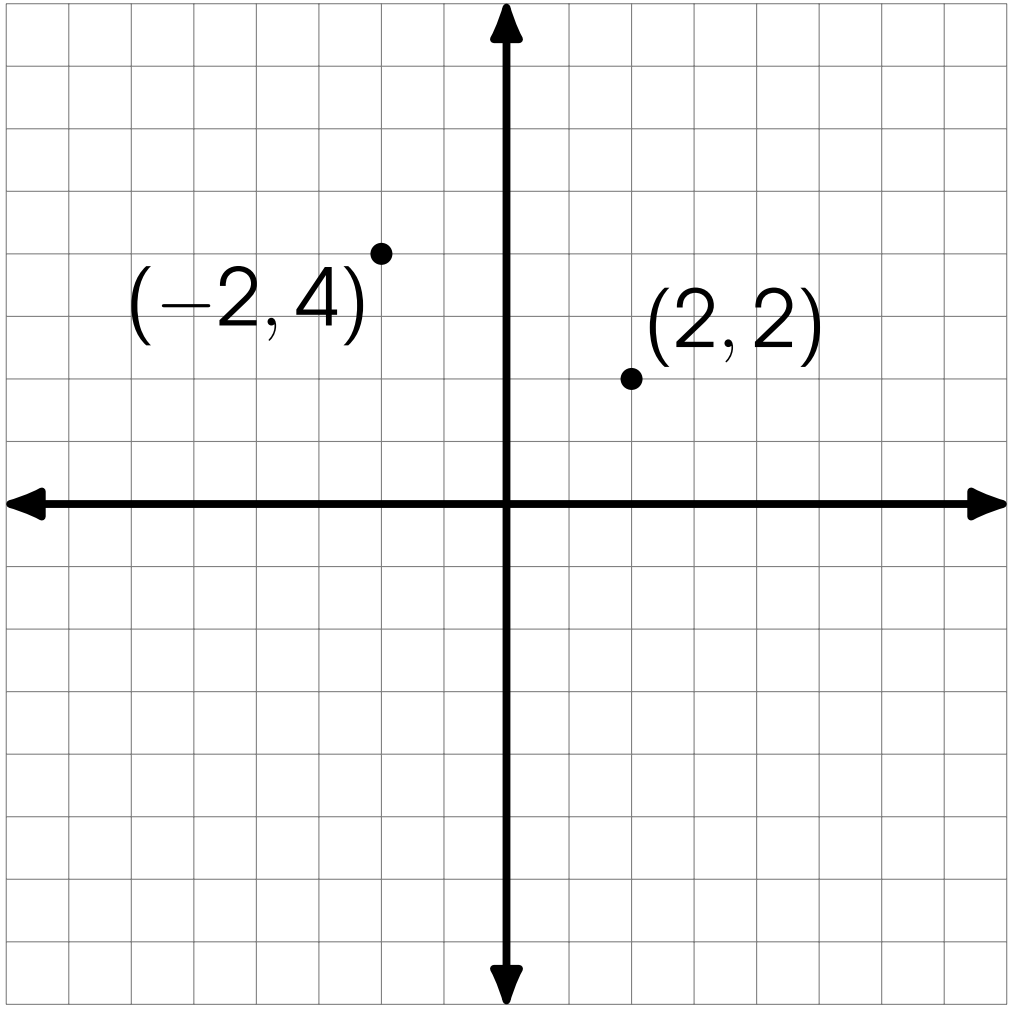

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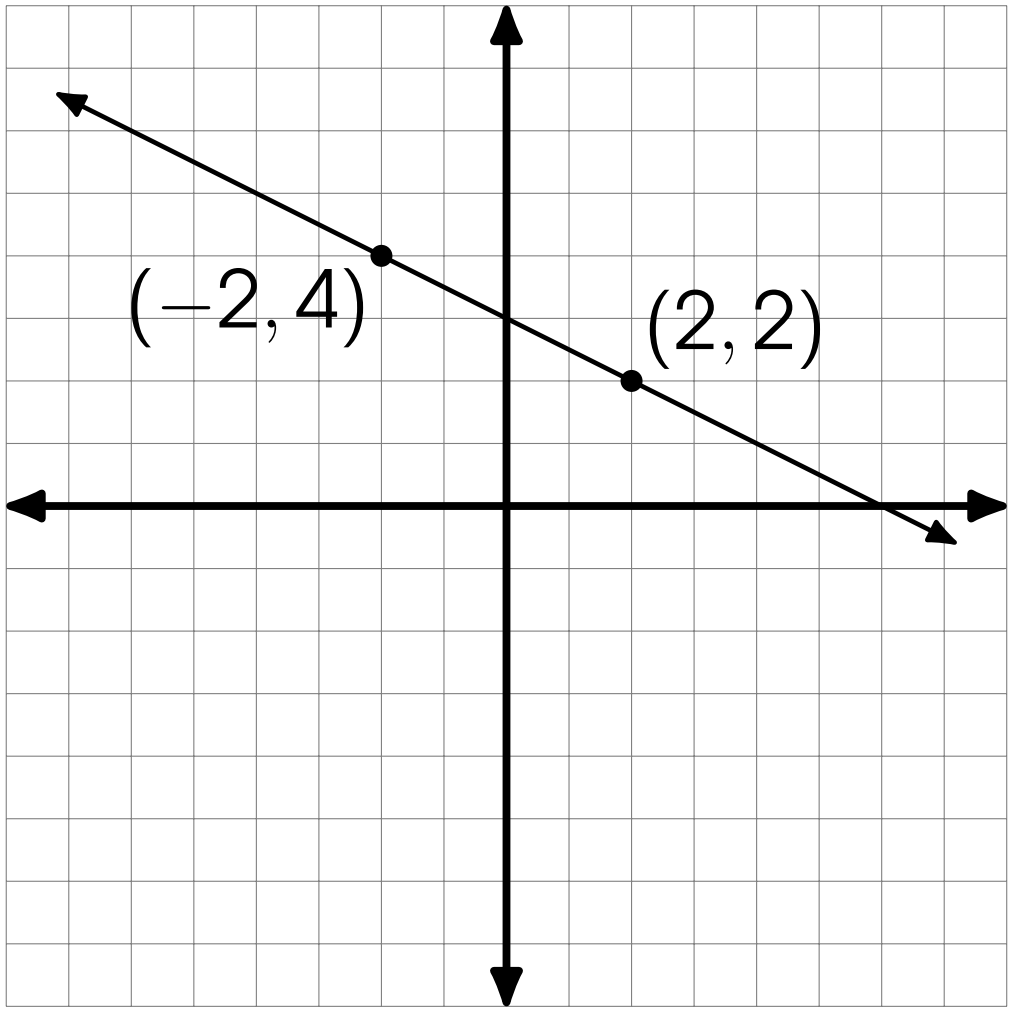

What is the x-intercept?

- If a line crosses the x-axis at the point $(a, 0)$, then the number a is the x-intercept of the line.

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- If a line crosses the x-axis at the point $(a, 0)$, then the number a is the x-intercept of the line.
- It is the x-coordinate of the point where the line crosses the x-axis.

What is the y-intercept?

- If a line crosses the y-axis at the point $(0, b)$, then the number b is the y-intercept of the line.

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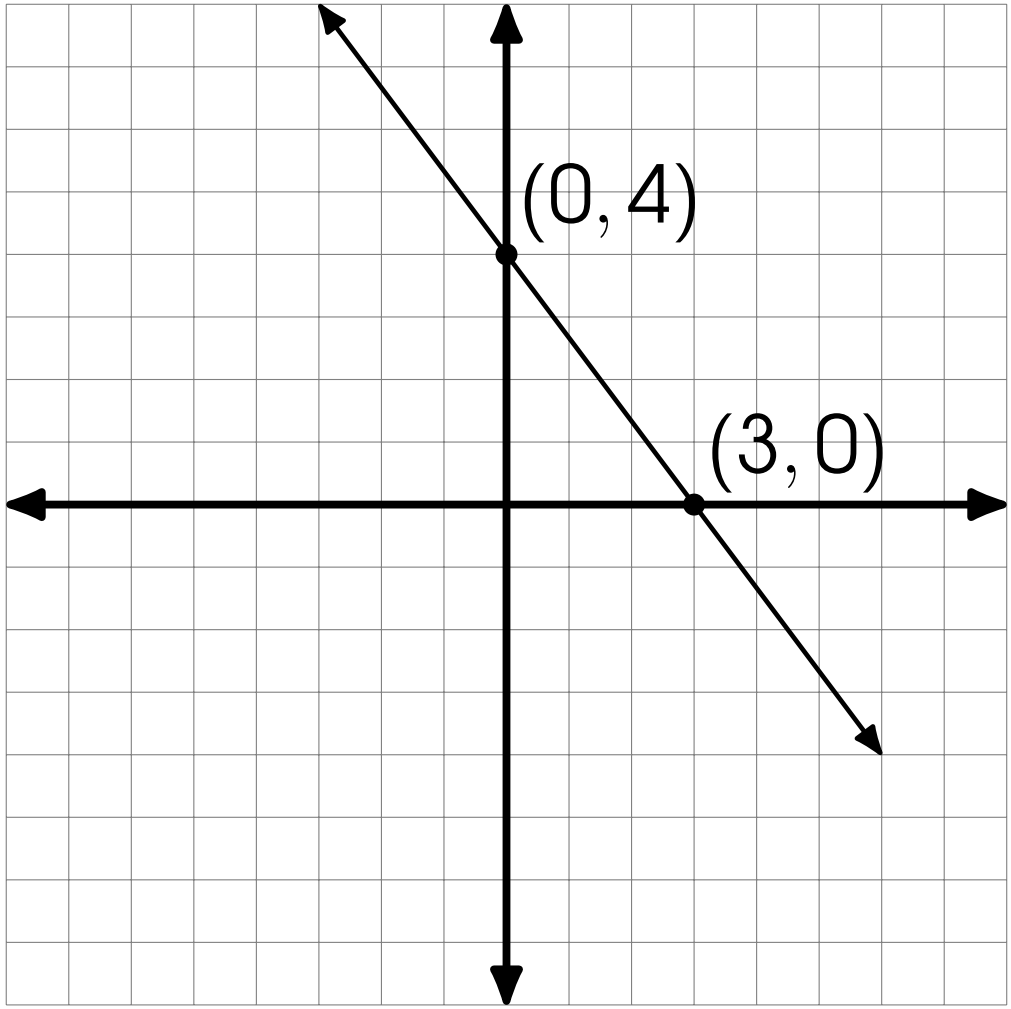
- If a line crosses the y-axis at the point $(0, b)$, then the number b is the y-intercept of the line.
- It is the y-coordinate of the point where the graph crosses the y-axis.

x- and y-intercepts



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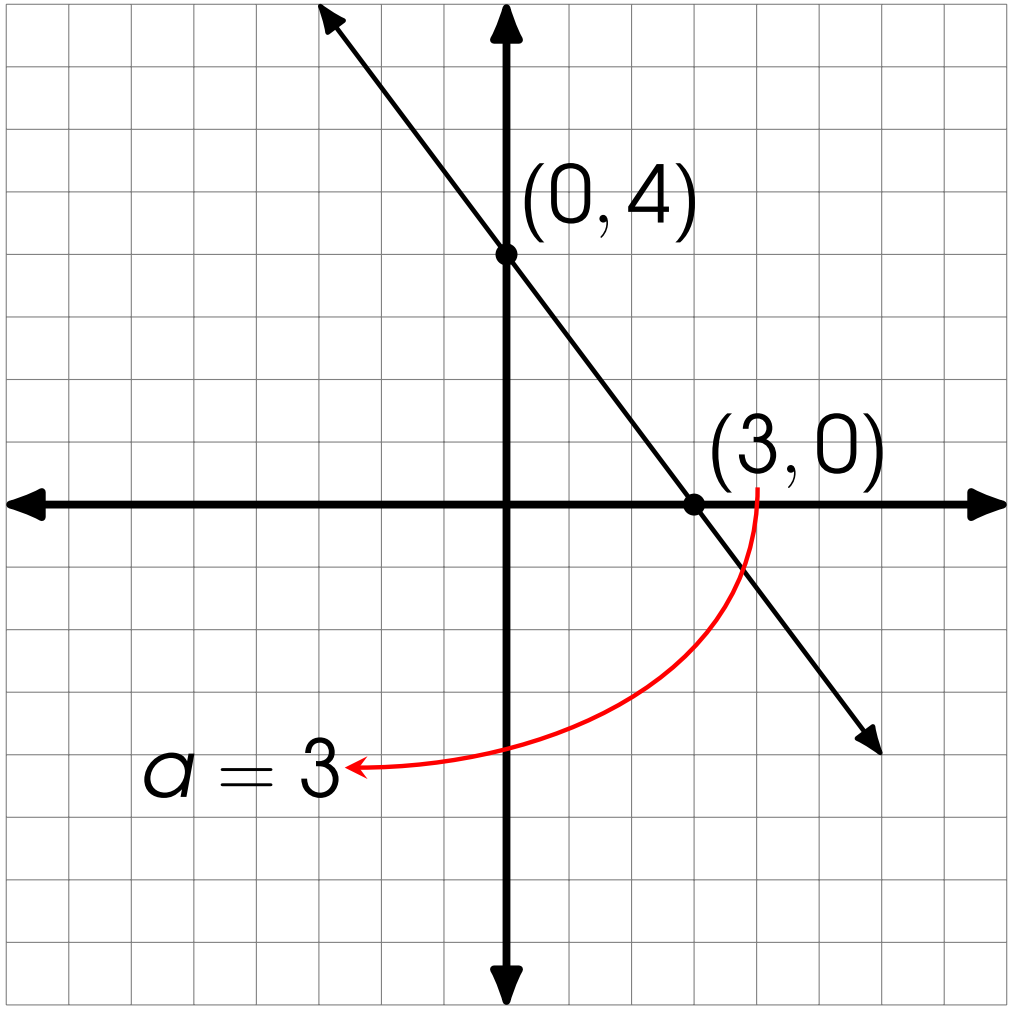

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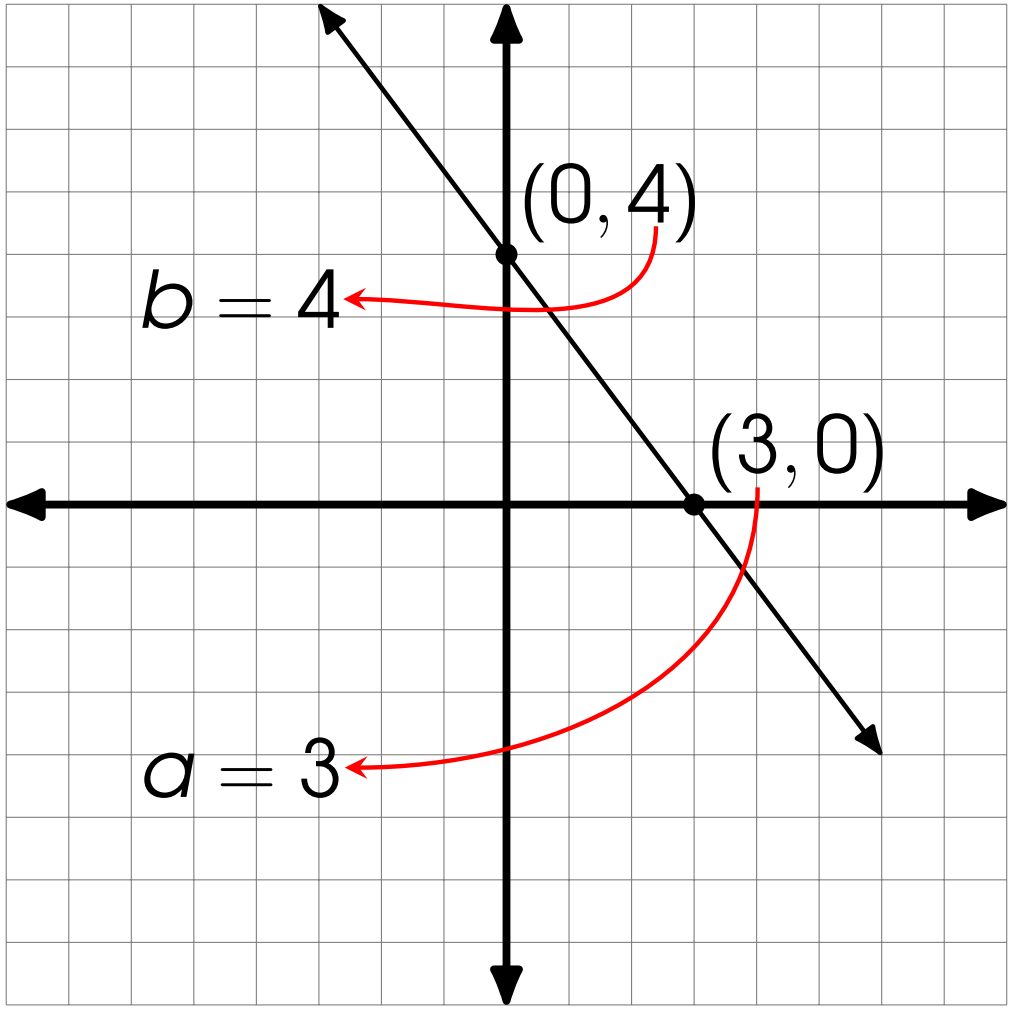

How to Graph Linear Equations Using the x- and y-intercepts?

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3. Plot the two points and connect them.

Example 1

Graph the equation $4x - 3y = 12$.

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$\frac{4x}{4} = \frac{12}{4}$	Division Property
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$\therefore$ the x-intercept a is 3 and the point is $(3, 0)$.

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$\therefore$ the y-intercept b is -4 and the point is $(0, -4)$.

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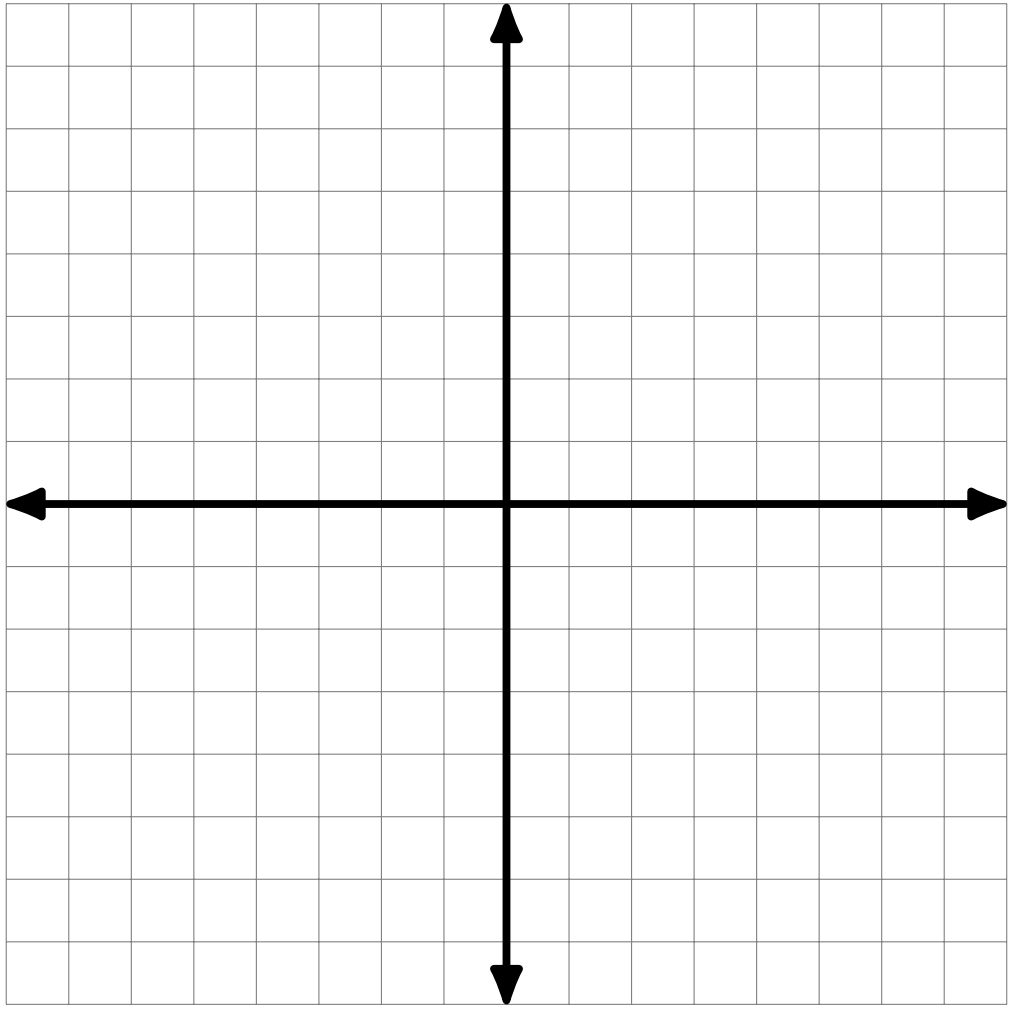

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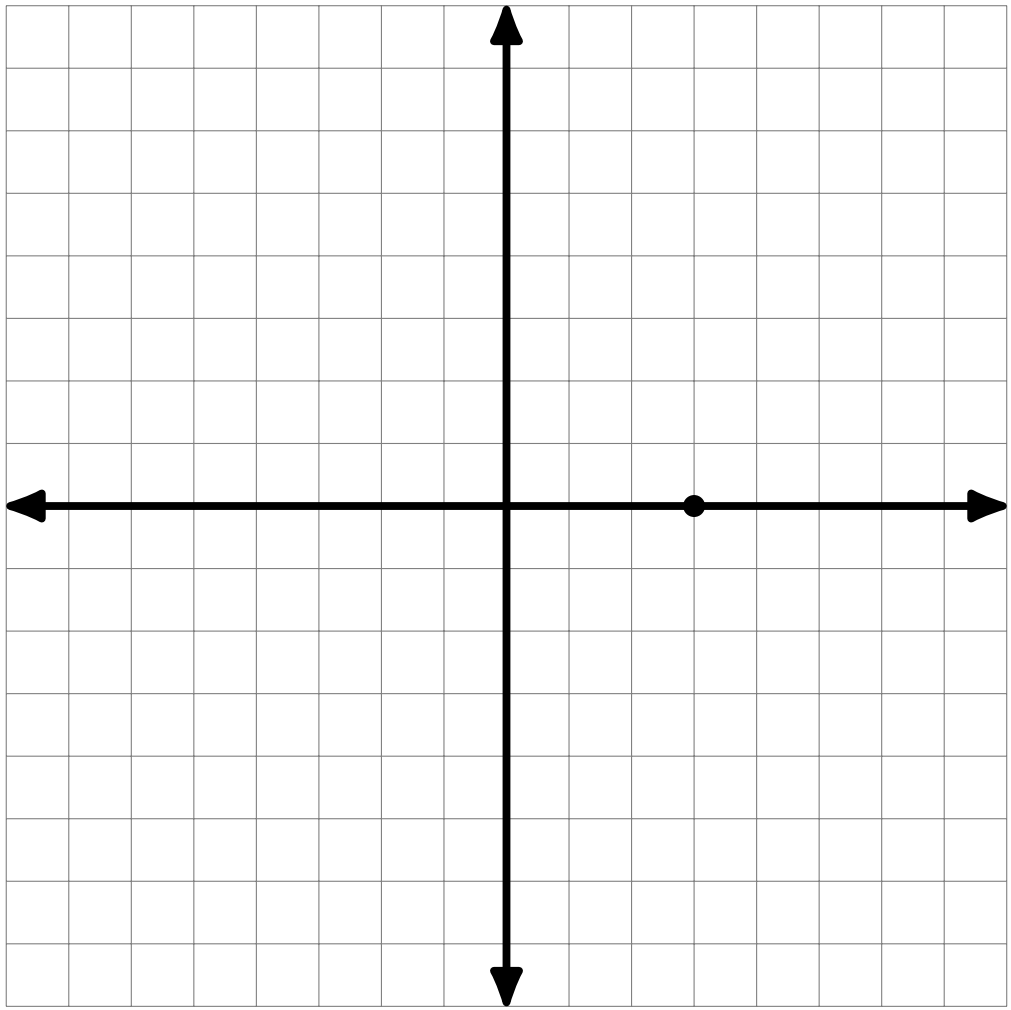

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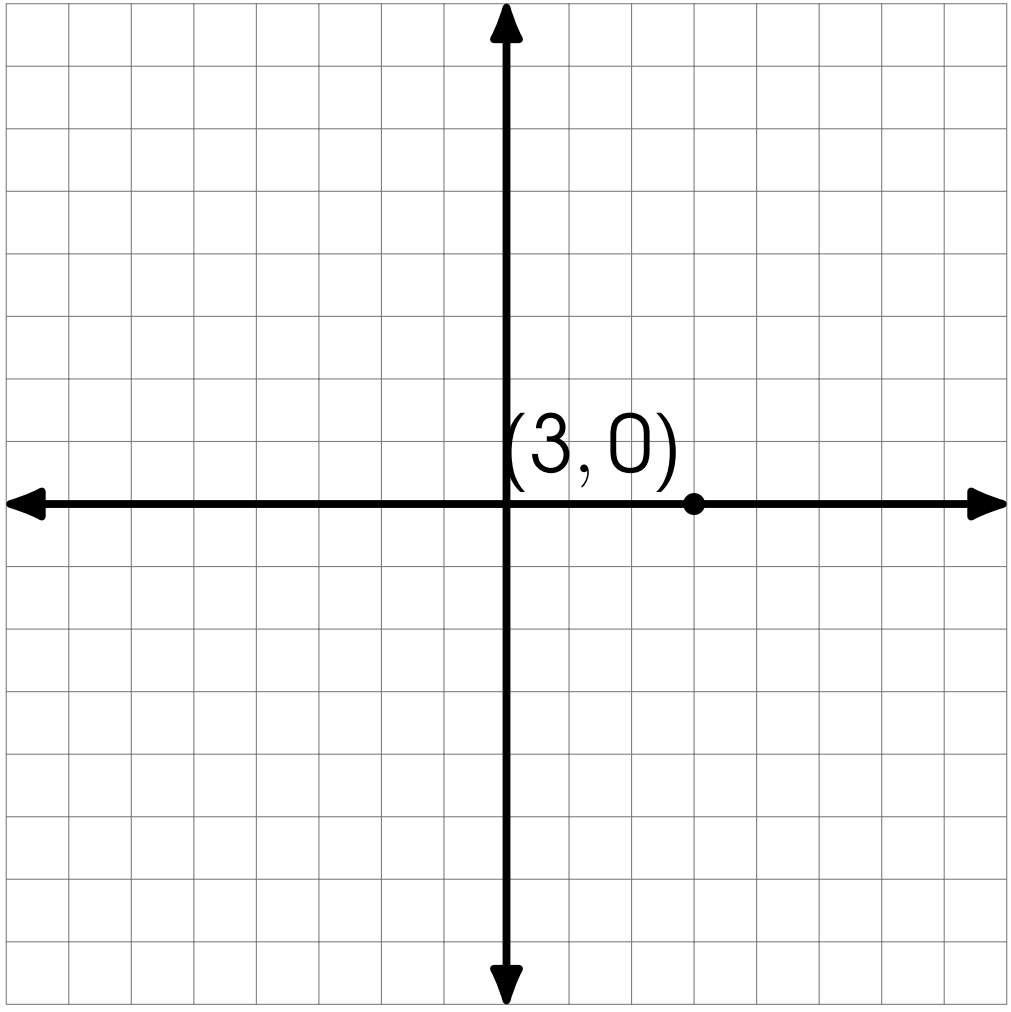

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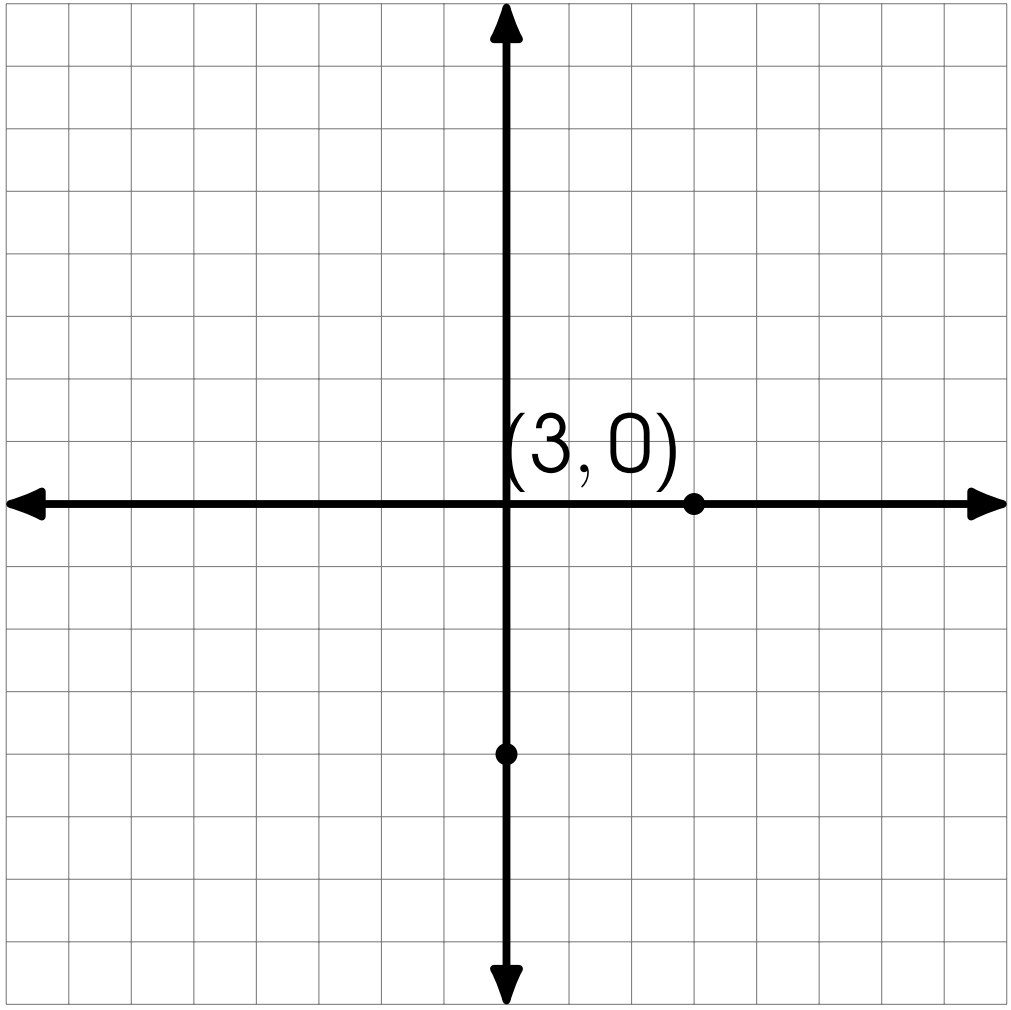

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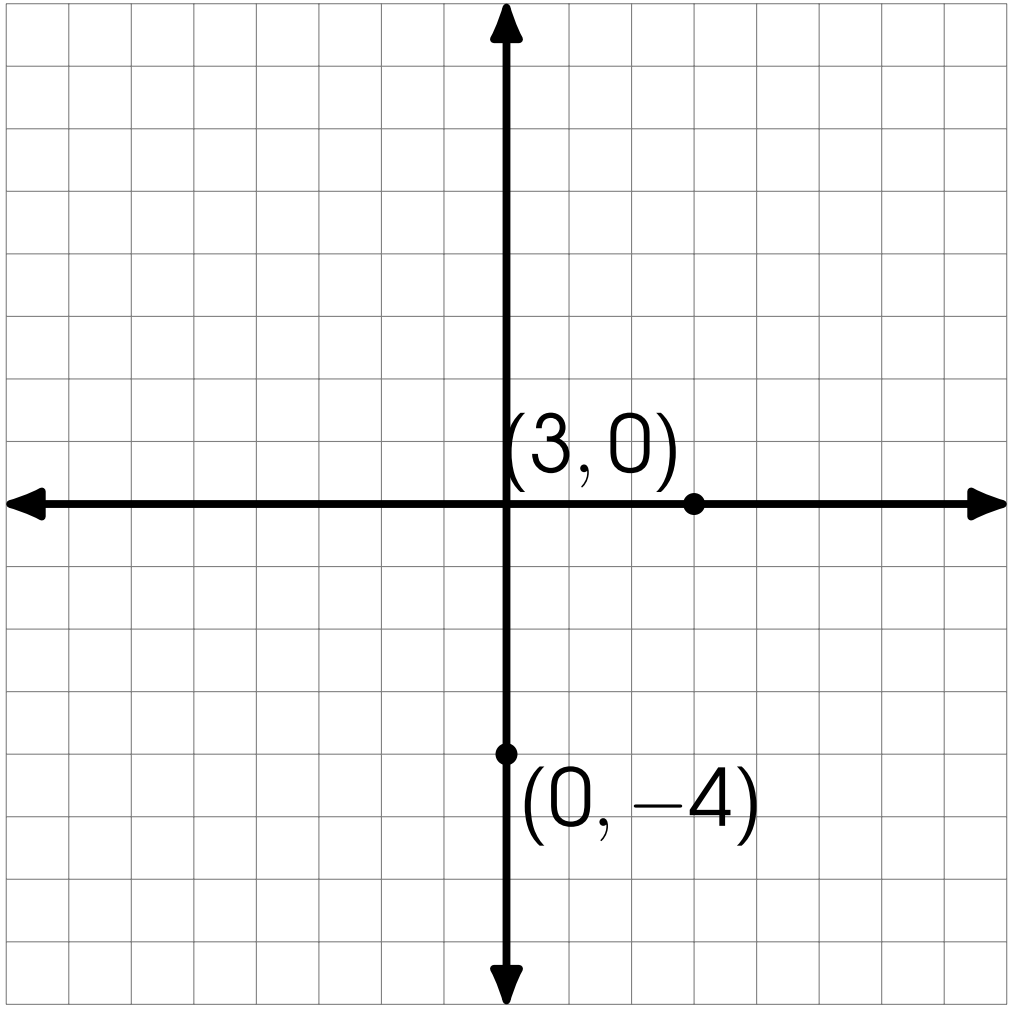

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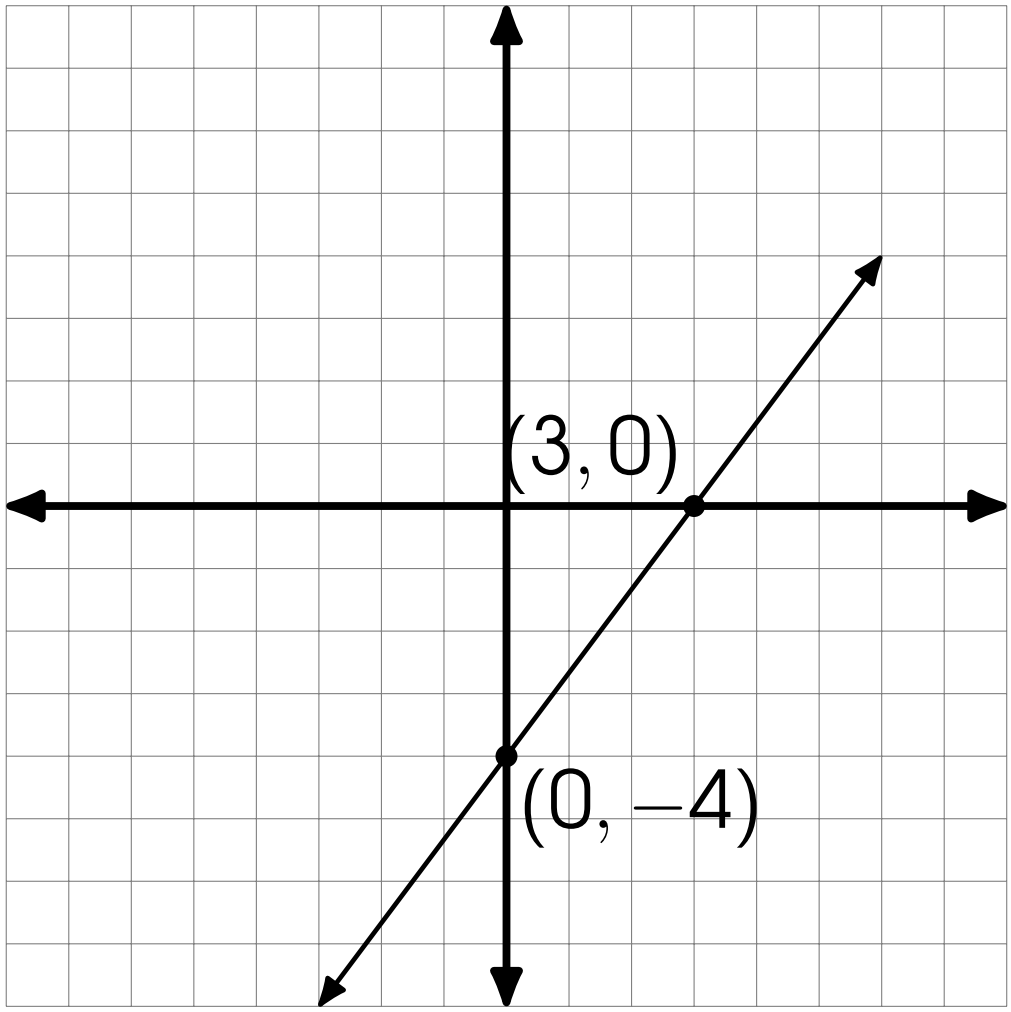

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$$\frac{-2x}{-2} = \frac{1}{-2} \qquad \text{Division Property}$$

$$x = -\frac{1}{2} \qquad \text{Simplification}$$

$\therefore a$ is $-\frac{1}{2}$ and the point is $\left(-\frac{1}{2}, 0\right)$.

How to Graph Linear Equations Using the x- and y-intercepts?

1. Let $y = 0$ to find the x-intercept.
2. Let $x = 0$ to find the y-intercept.

Example 1

Graph the equation $y = 2x + 1$.

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$$y = 2(0) + 1 \quad \text{Substitution Property}$$

$$y = 0 + 1 \quad \text{Simplification}$$

$$y = 1 \quad \text{Simplification}$$

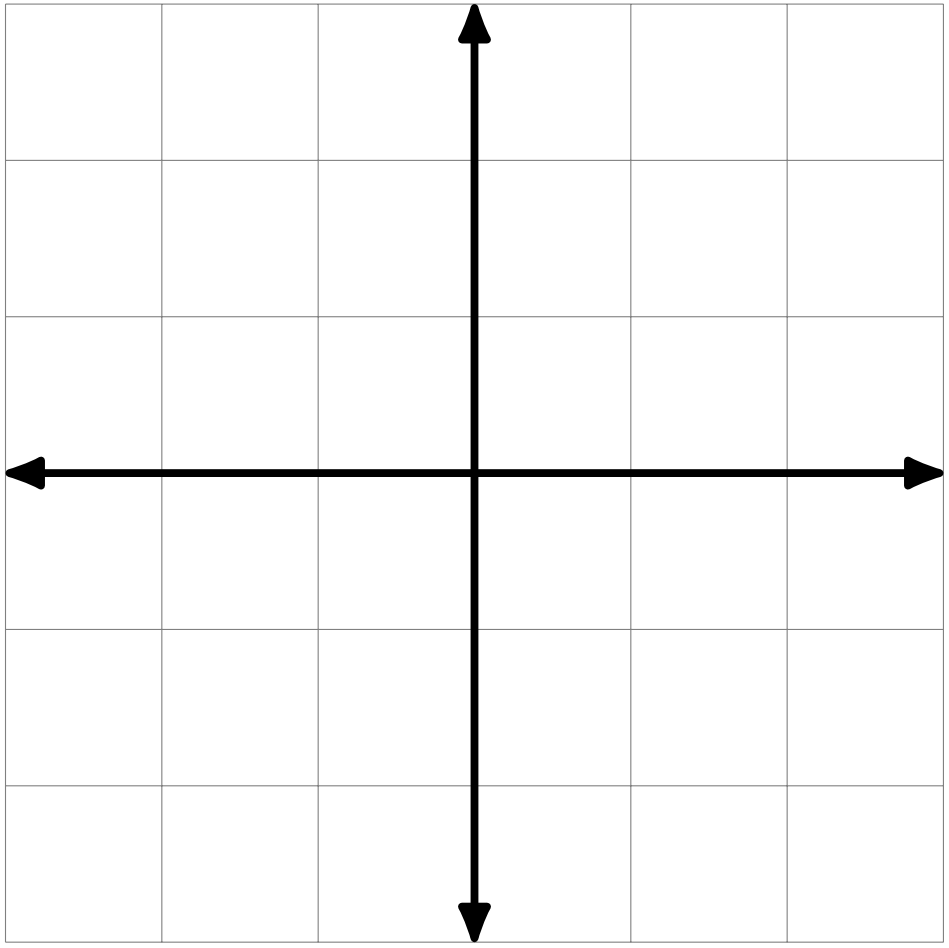
$\therefore$ the y-intercept b is 1 and the point is $(0, 1)$.

How to Graph Linear Equations Using the x- and y-intercepts?

1. Let $y = 0$ to find the x-intercept.
2. Let $x = 0$ to find the y-intercept.
3. Plot the two points and connect them.

Example 1

Plot $\left(-\frac{1}{2}, 0\right)$ and $(0, 1)$.



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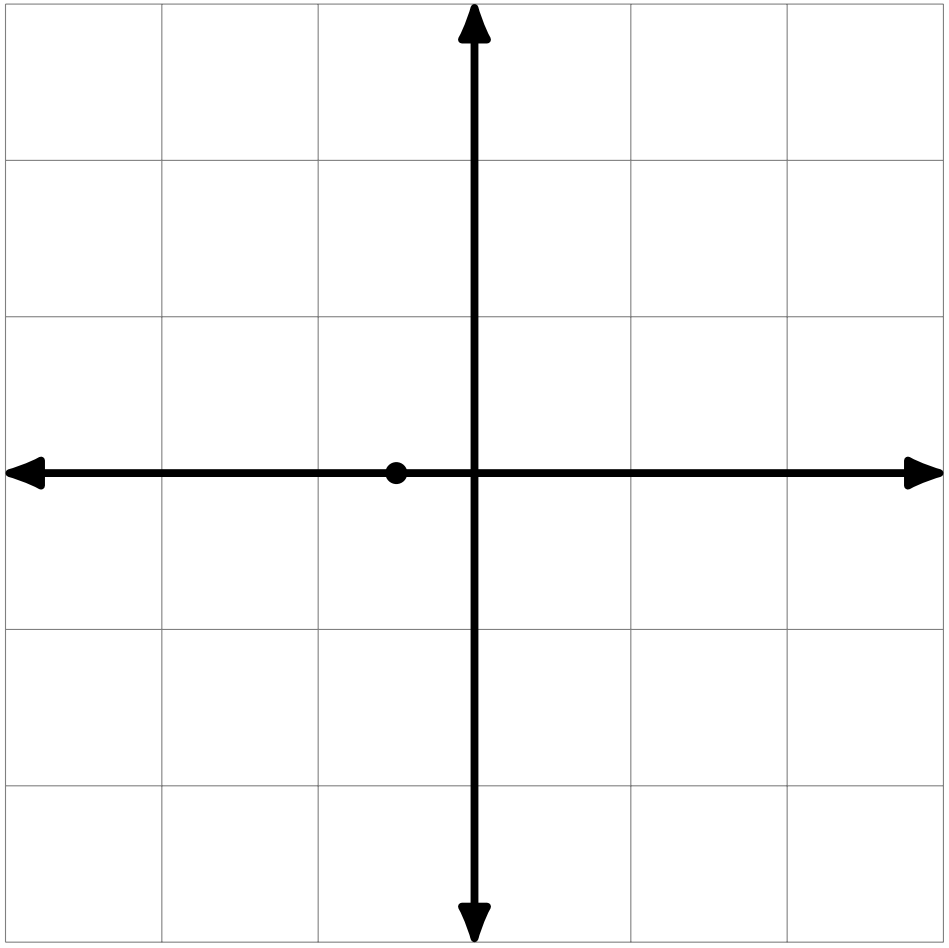

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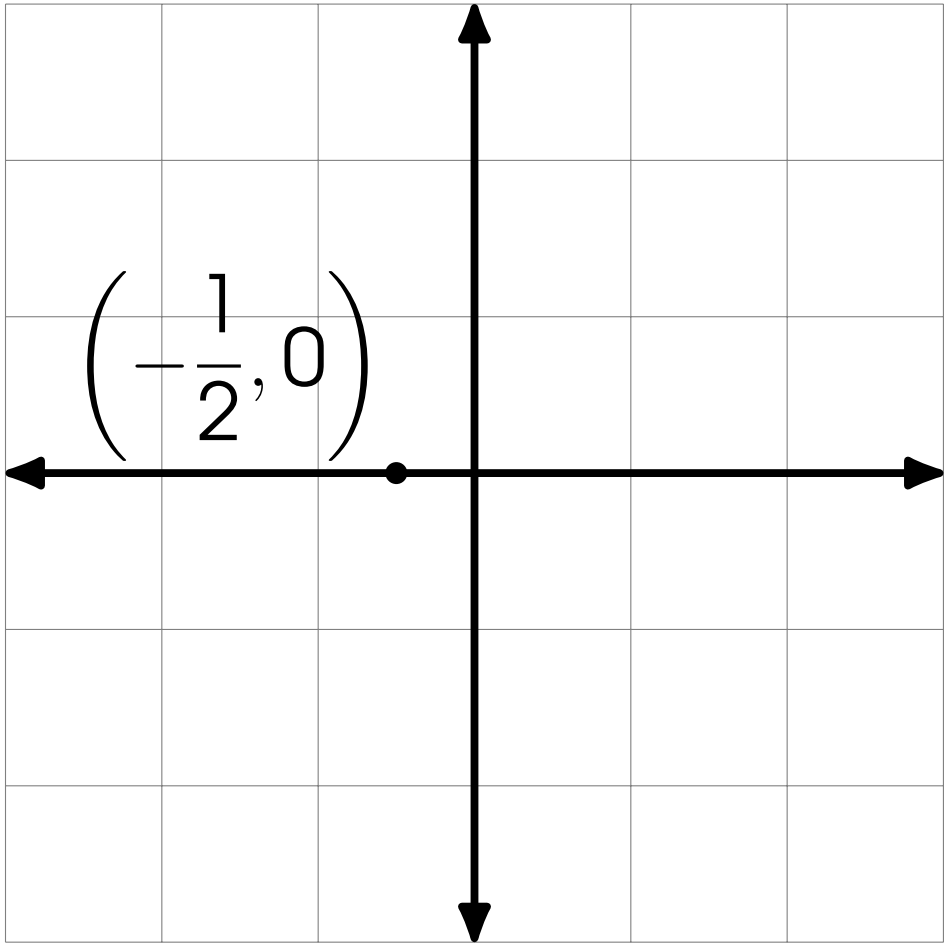

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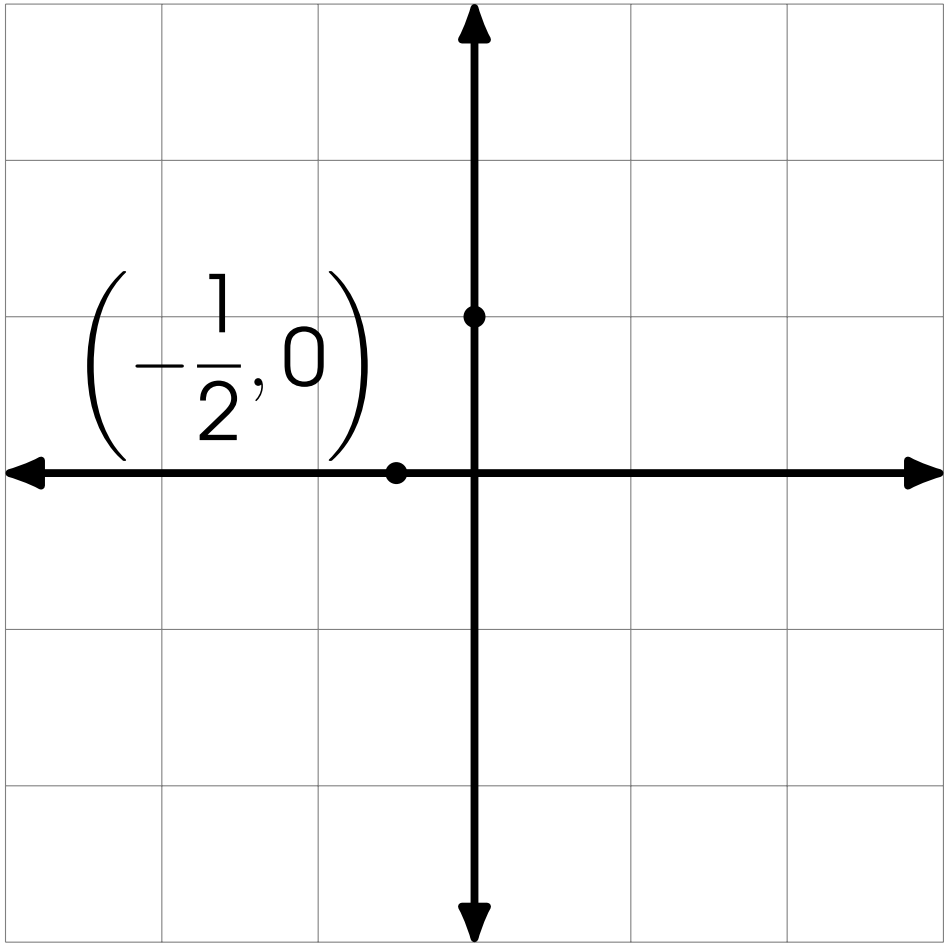

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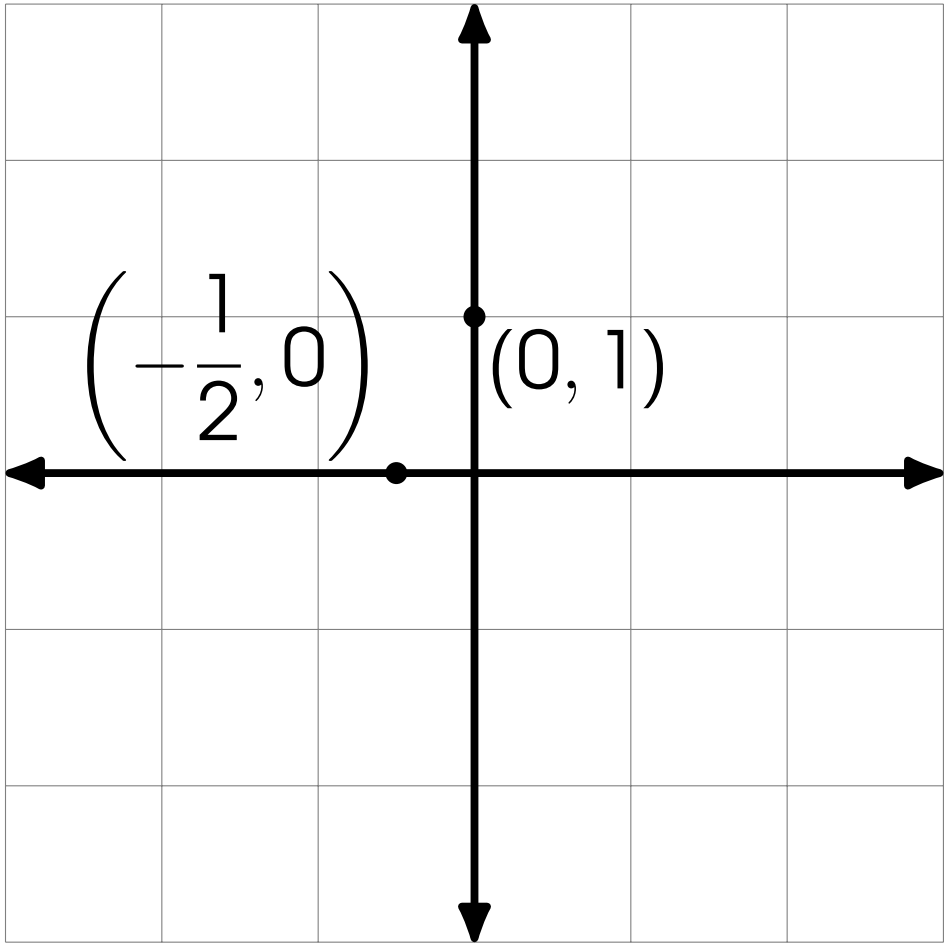

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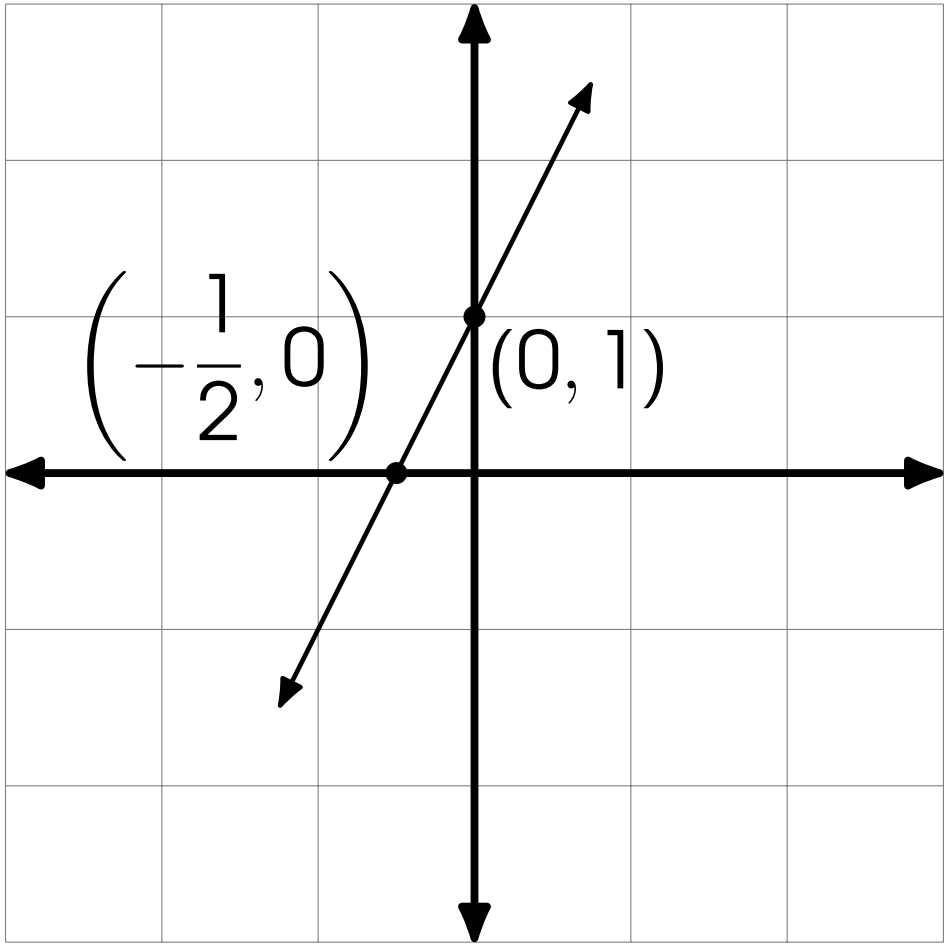

How to Graph Linear Equations Using the Slope and a Point?

1. Plot the given point.

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3. Connect the two points.

Example 1

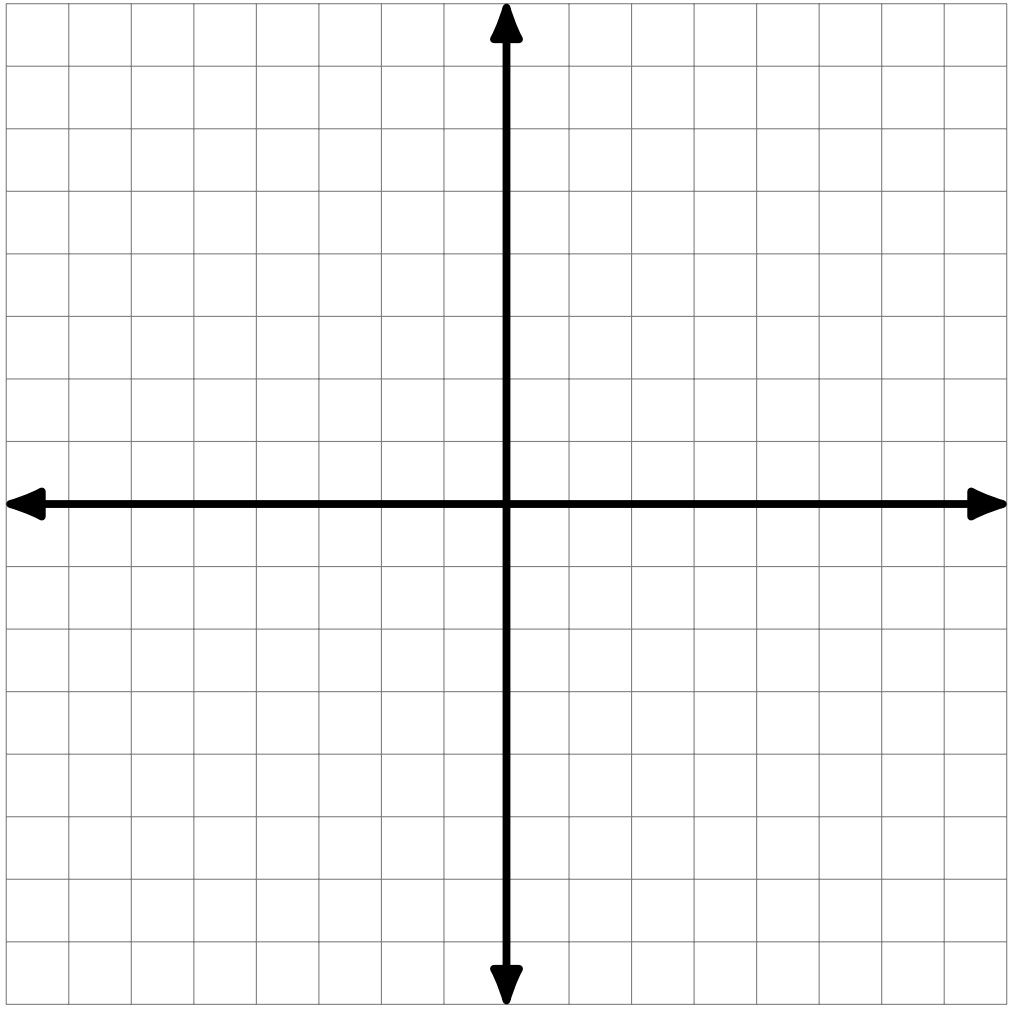
Graph the linear equation given the point $(1, 3)$ and the slope $\frac{2}{3}$.

How to Graph Linear Equations Using the Slope and a Point?

1. Plot the given point.

Example 1

Plot $(1, 3)$.



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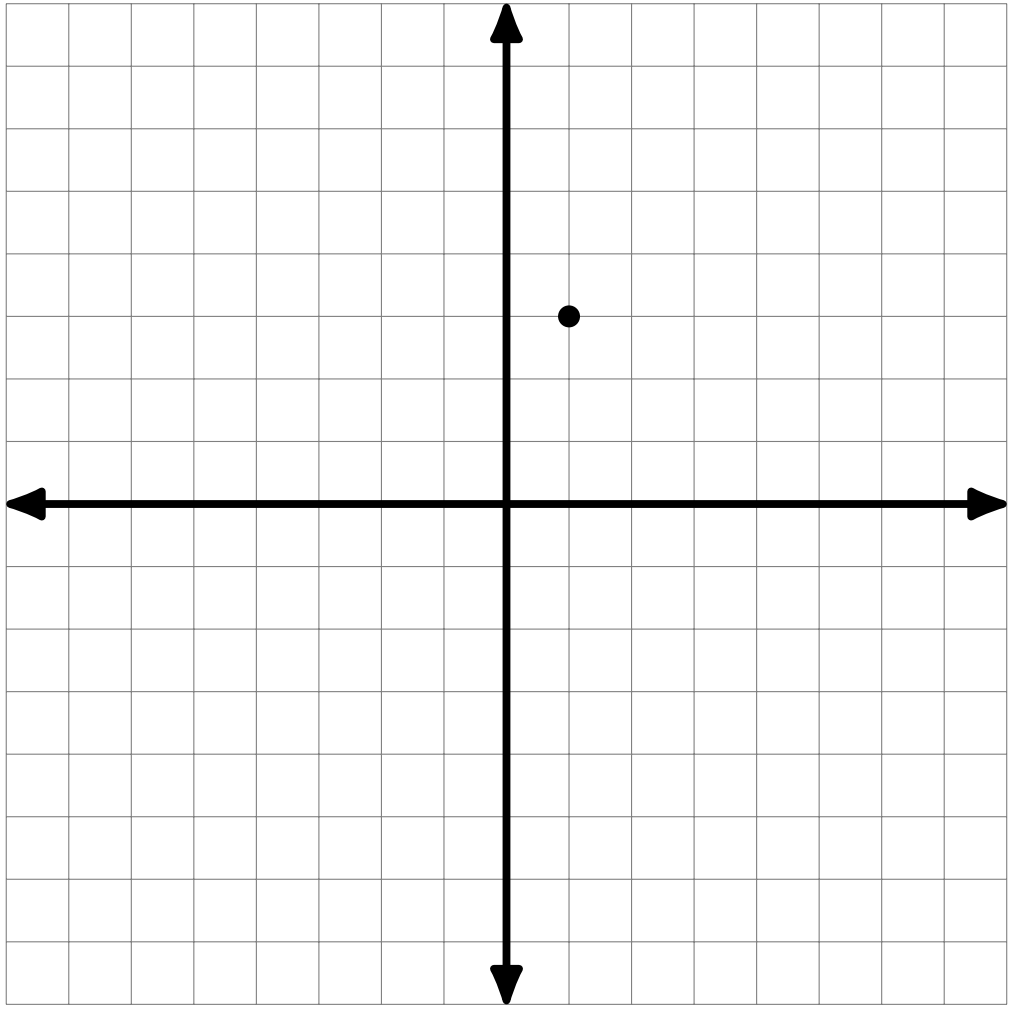

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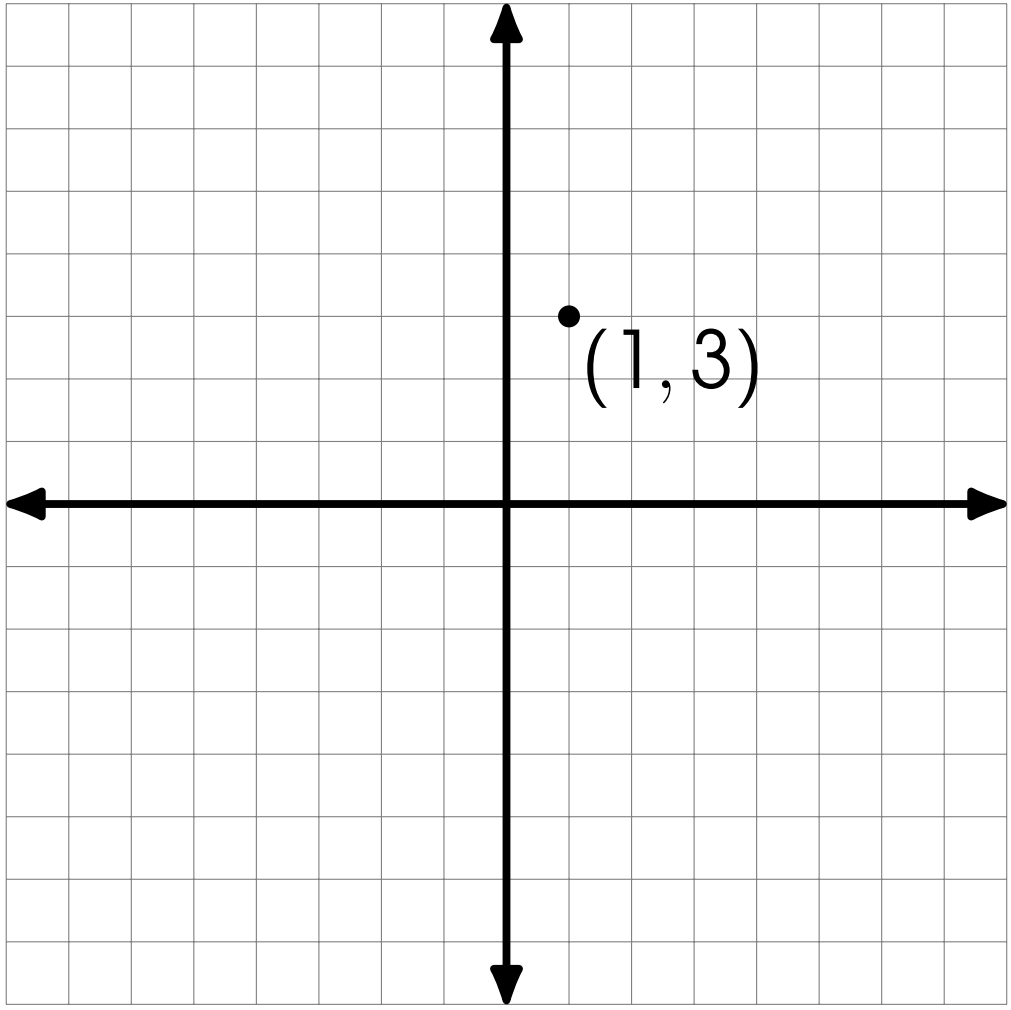
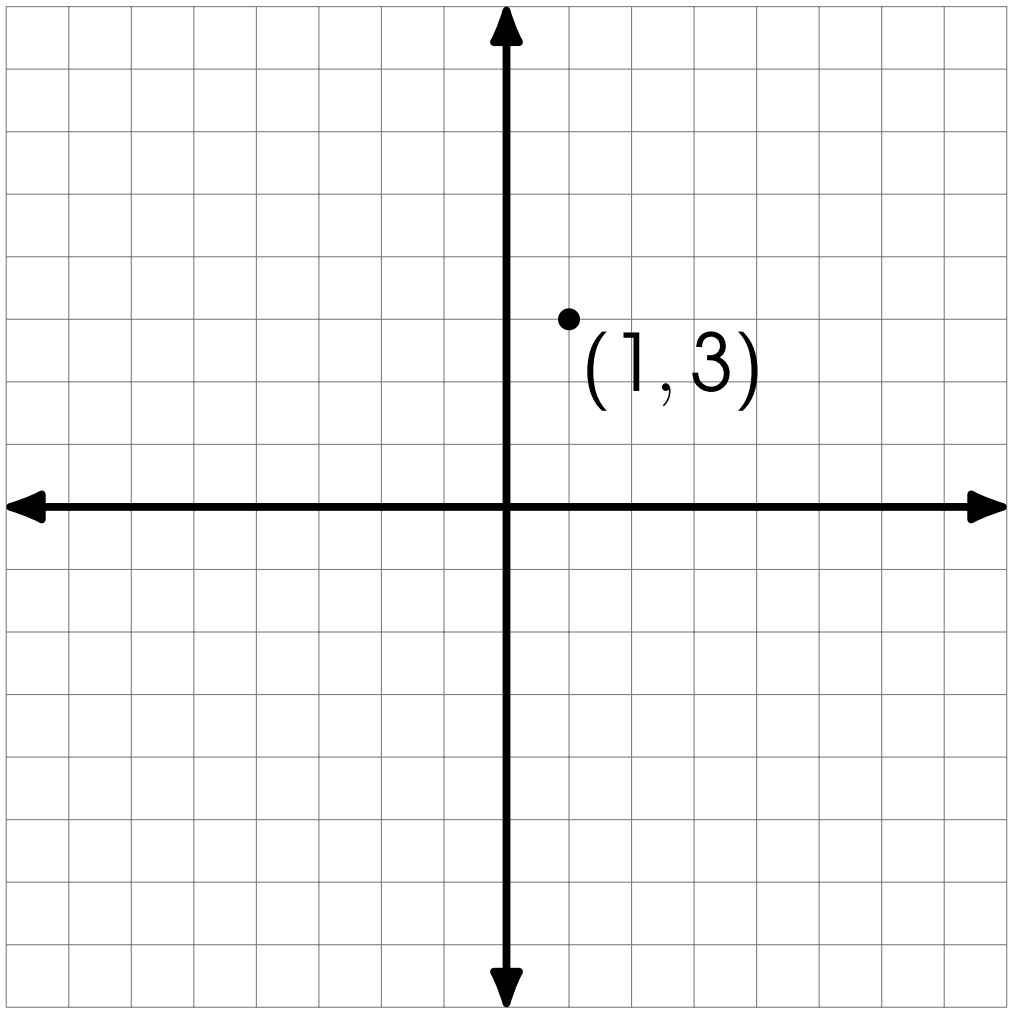


How to Graph Linear Equations Using the Slope and a Point?

1. Plot the given point.
2. Use the slope to get the other point.

Example 1

$$\text{Slope } m = \frac{\text{rise}}{\text{run}} = \frac{2}{3}$$



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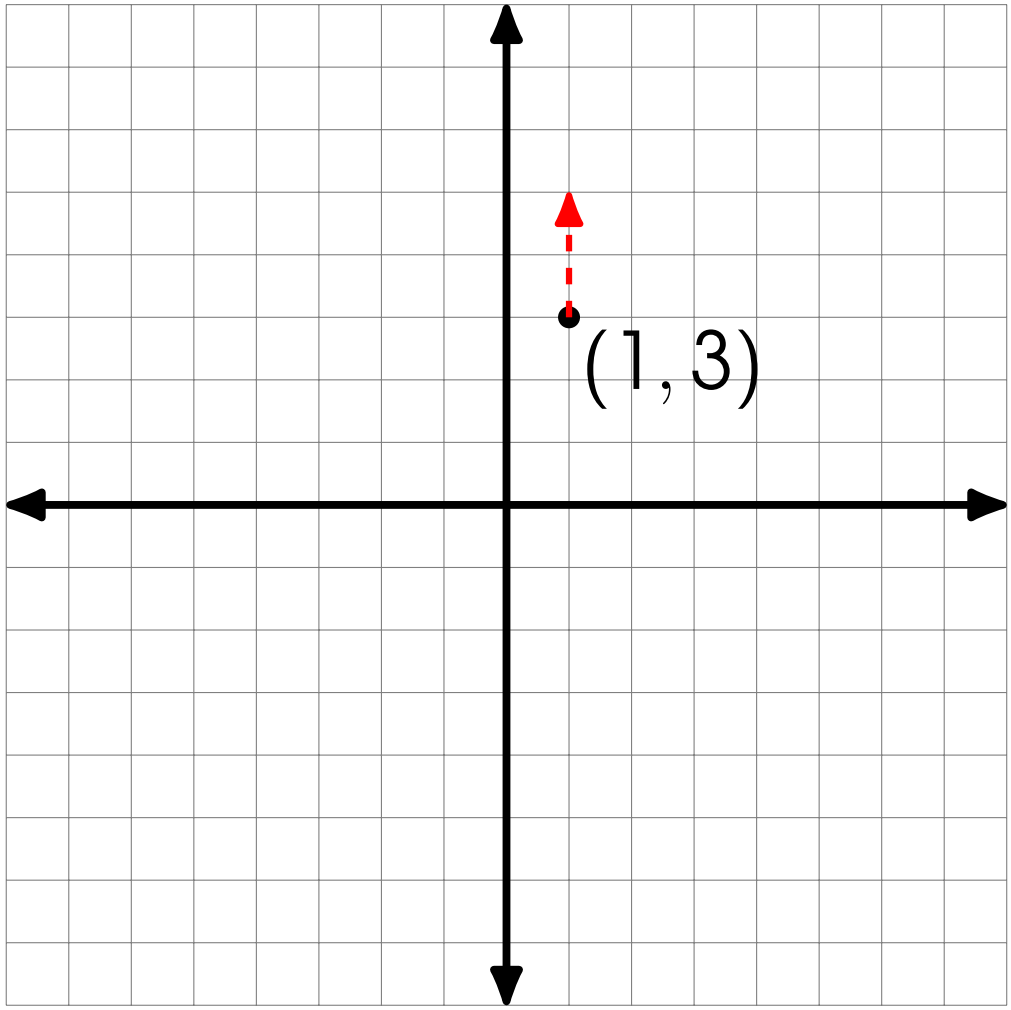

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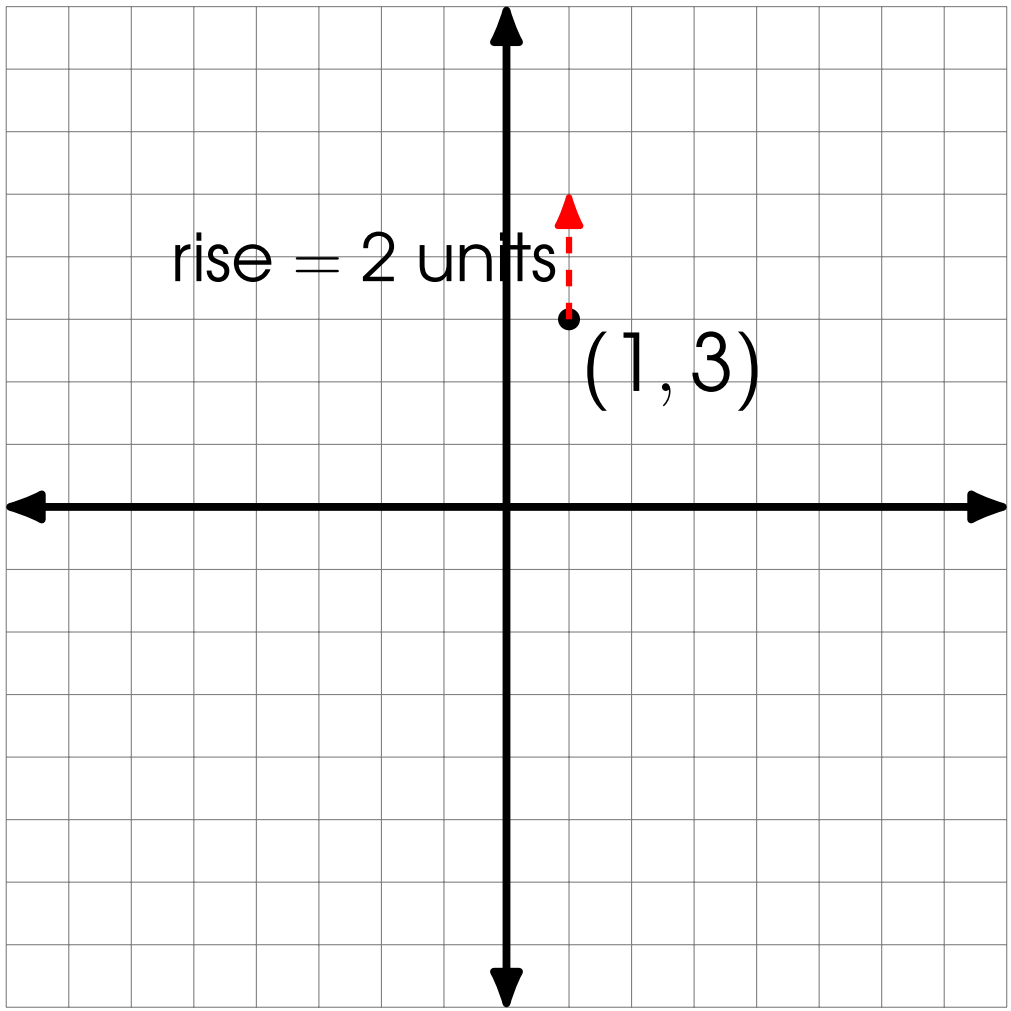

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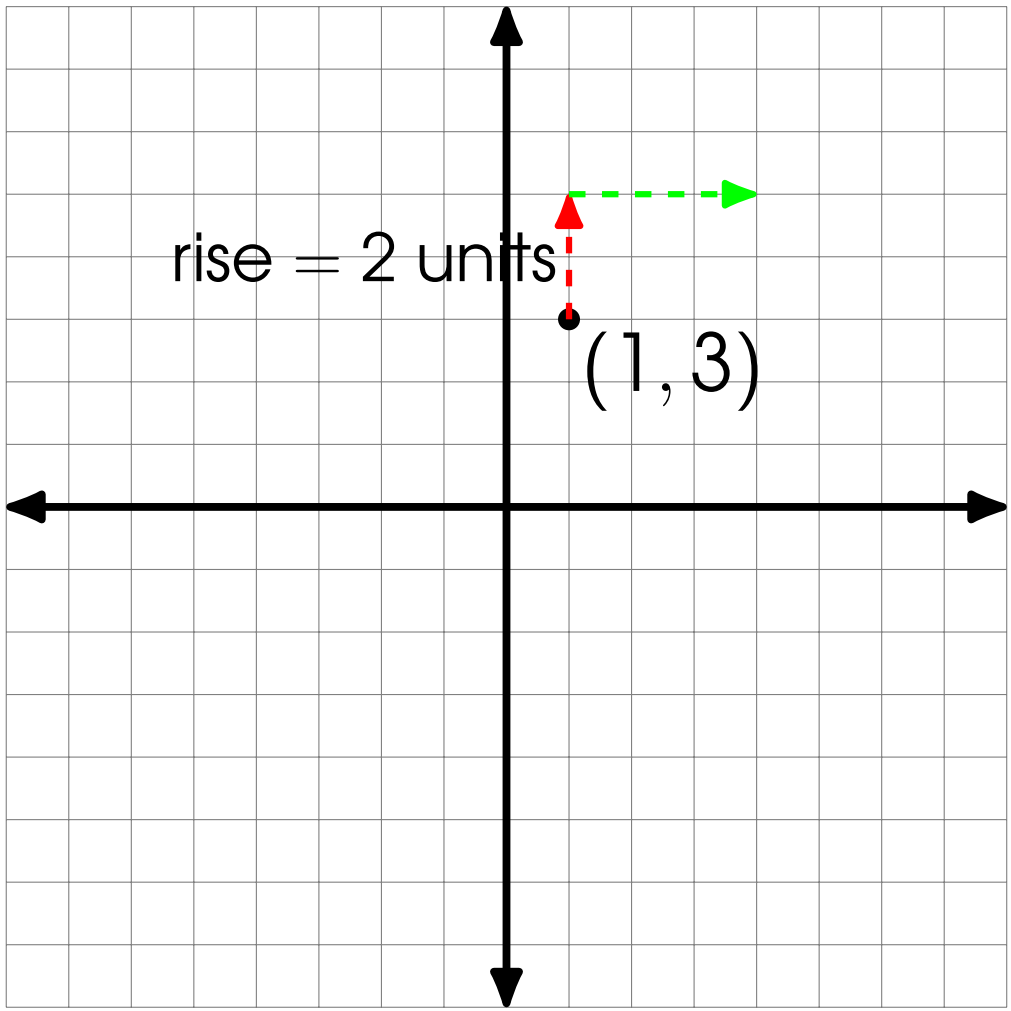

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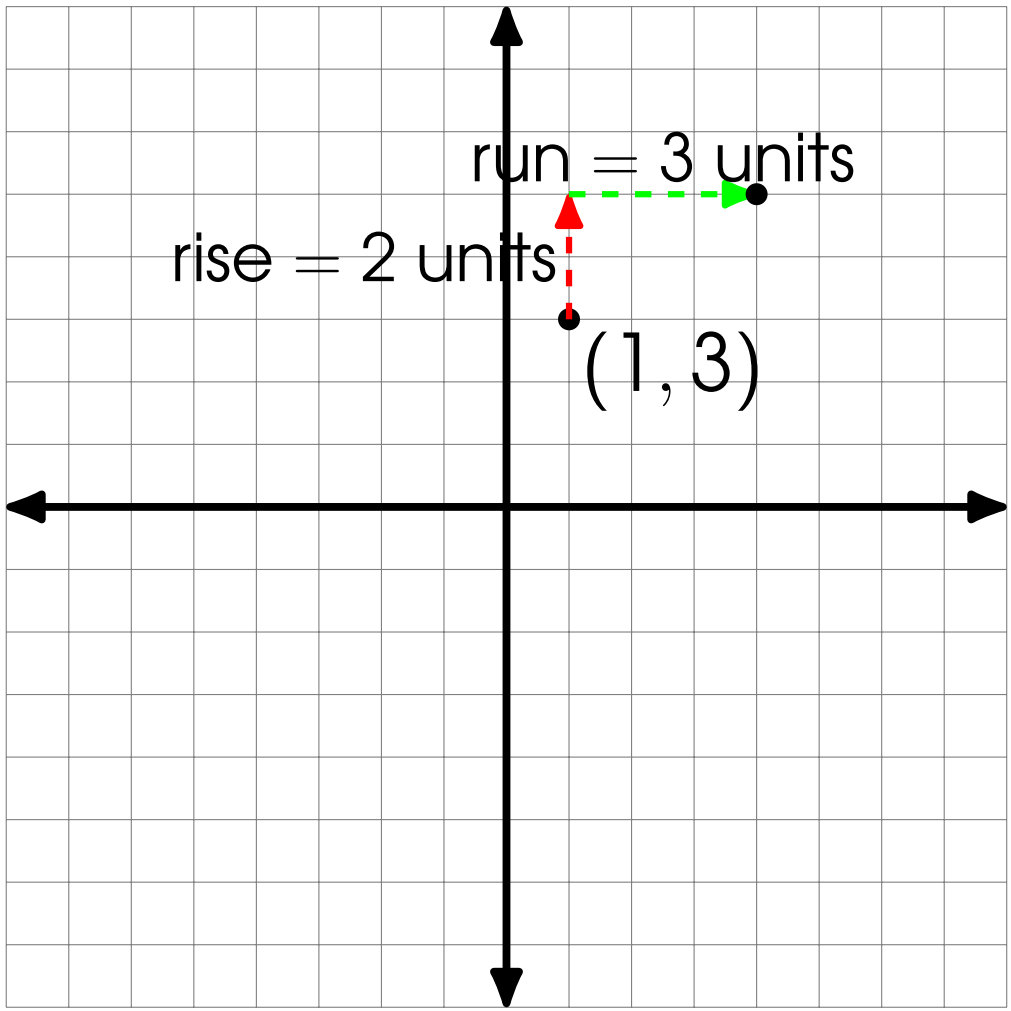

How to Graph Linear Equations Using the Slope and a Point?

1. Plot the given point.
2. Use the slope to get the other point.
3. Connect the two points.

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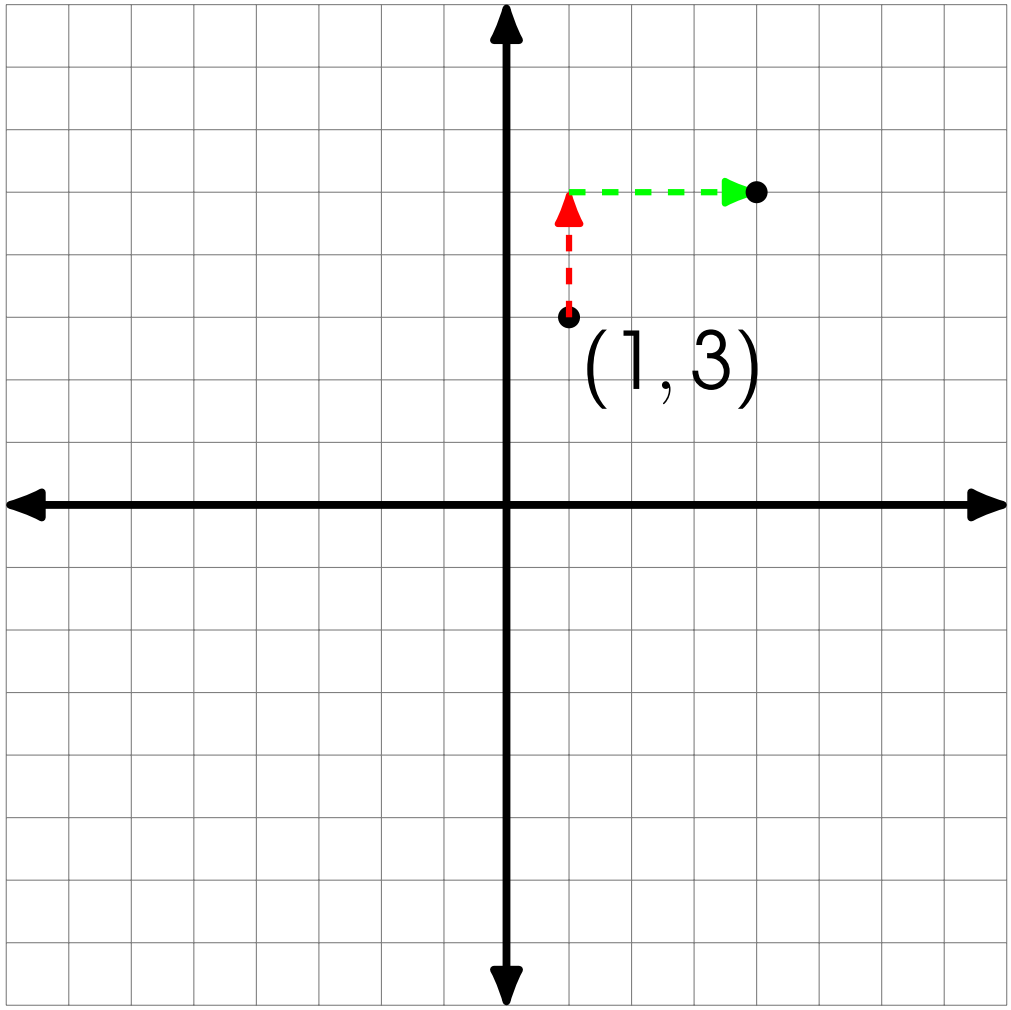
$$\text{Slope } m = \frac{\text{rise}}{\text{run}} = \frac{2}{3}$$



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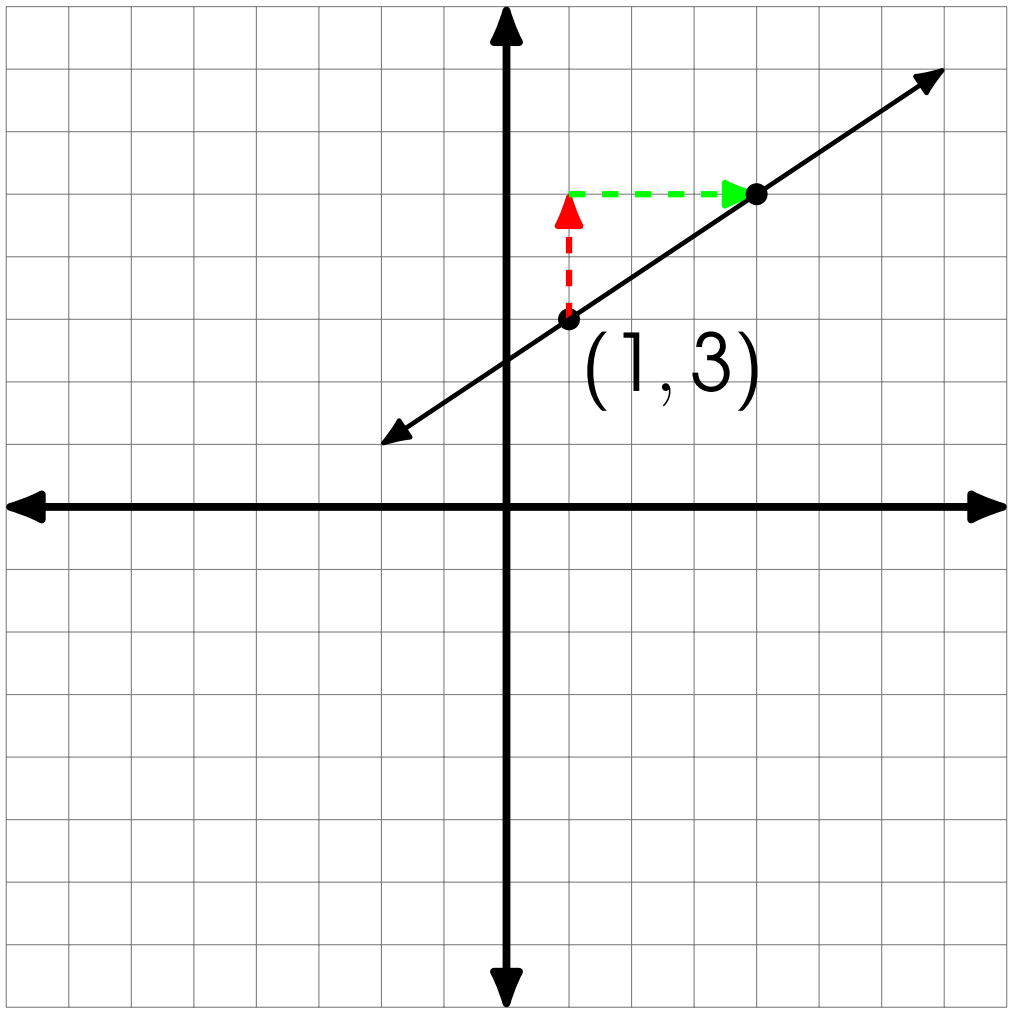


Example 2

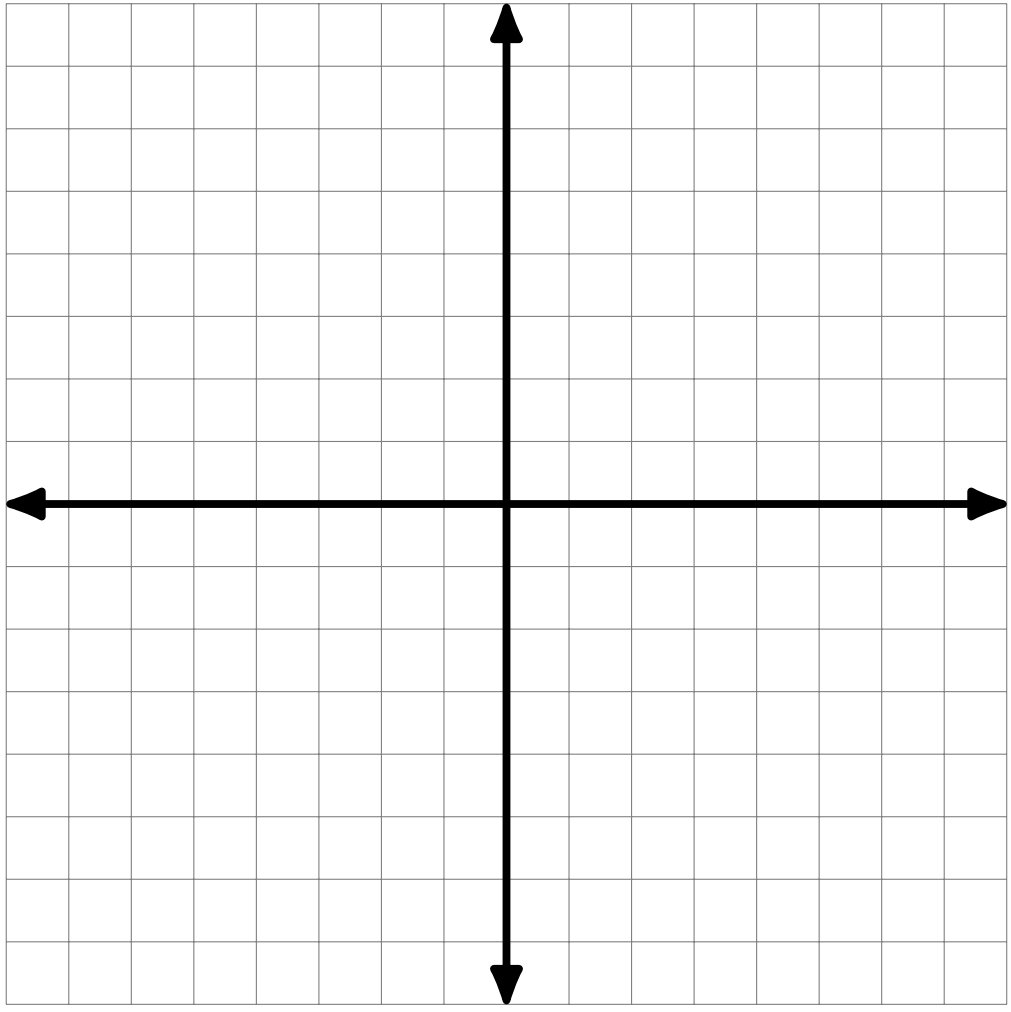
Graph the linear equation given the point $(-2, 2)$ and the slope -3.

How to Graph Linear Equations Using the Slope and a Point?

1. Plot the given point.

Example 2

Plot $(-2, 2)$.



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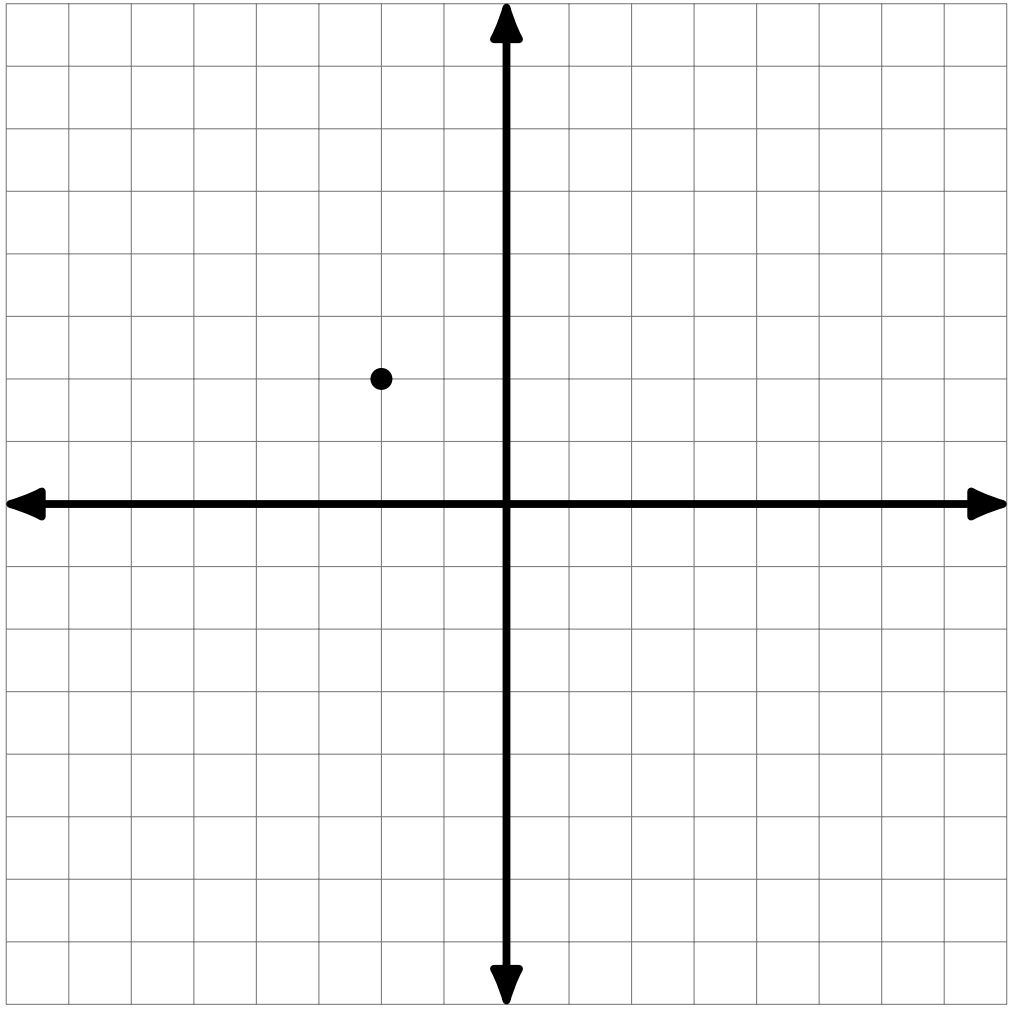

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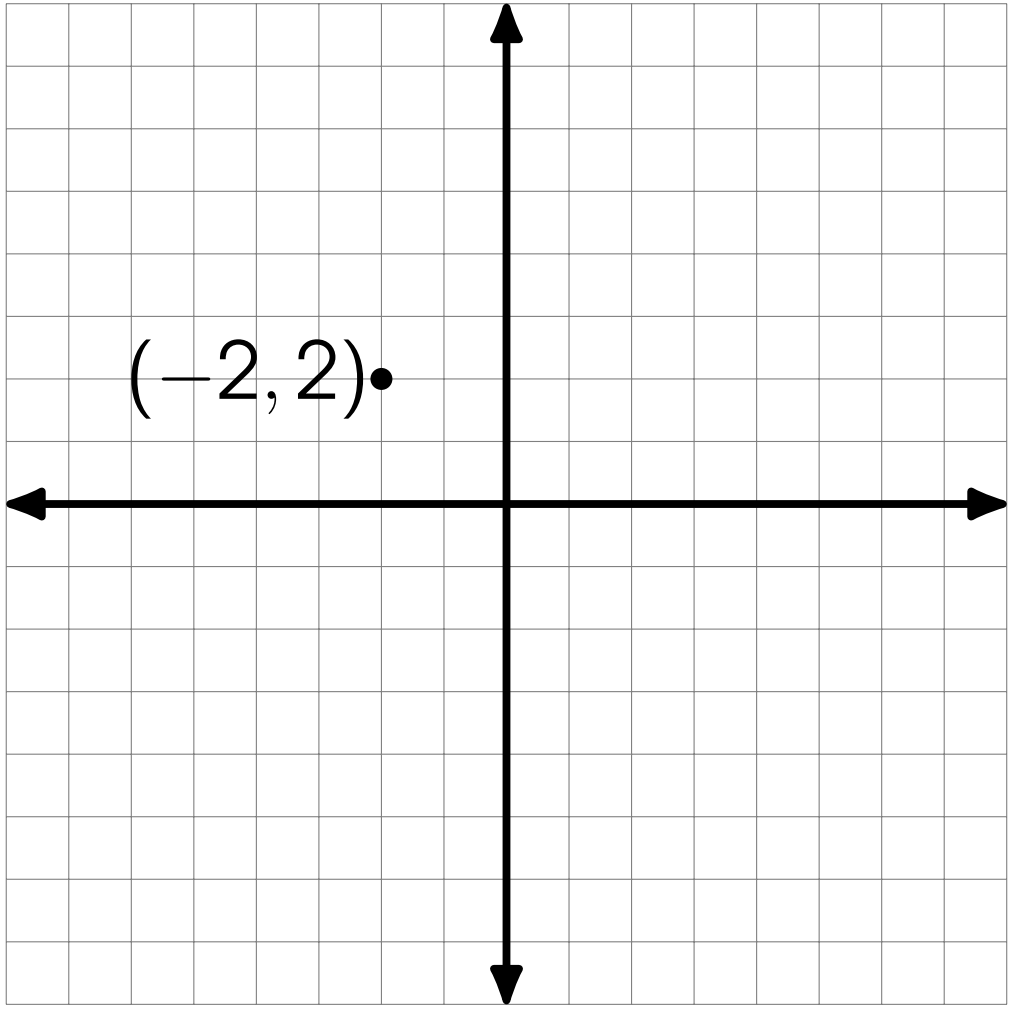

How to Graph Linear Equations Using the Slope and a Point?

1. Plot the given point.
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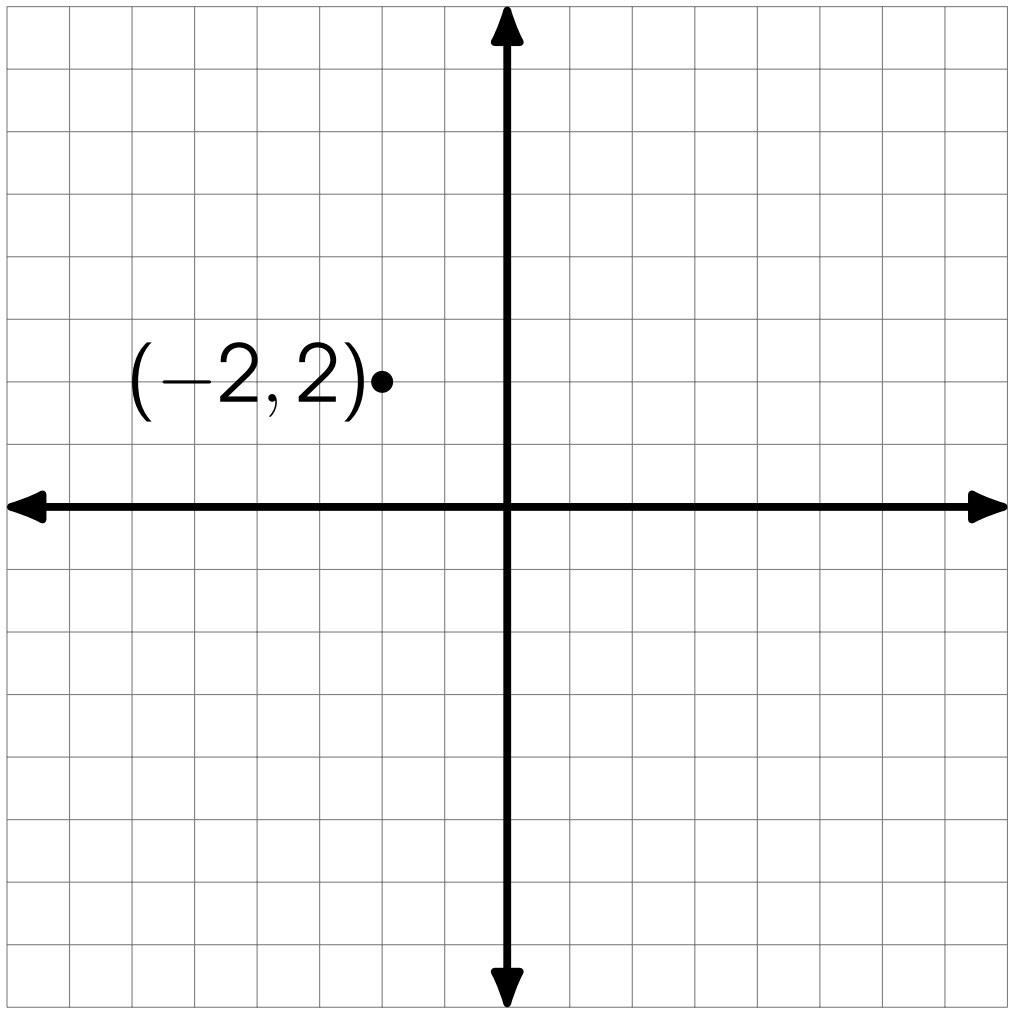
Example 2

$$\text{Slope } m = \frac{\text{rise}}{\text{run}} = -3 = \frac{-3}{1}$$



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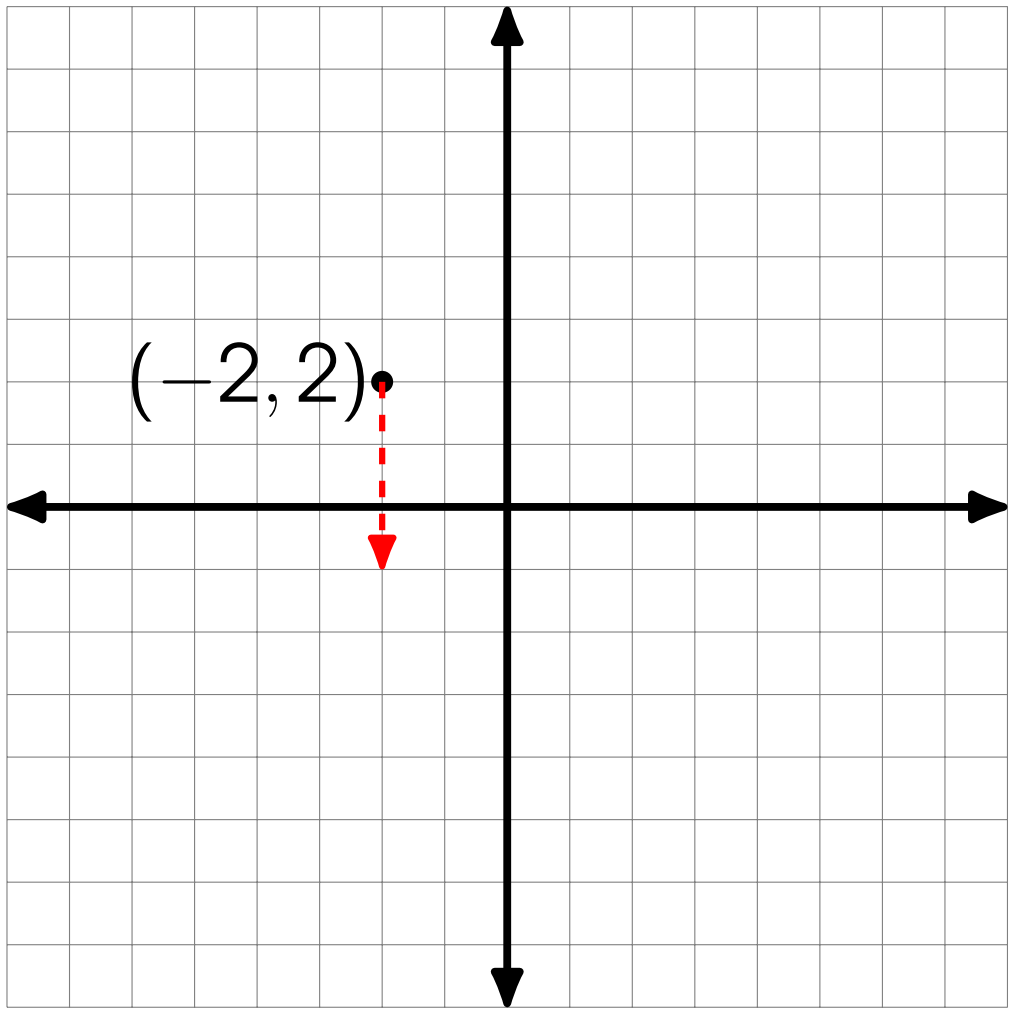

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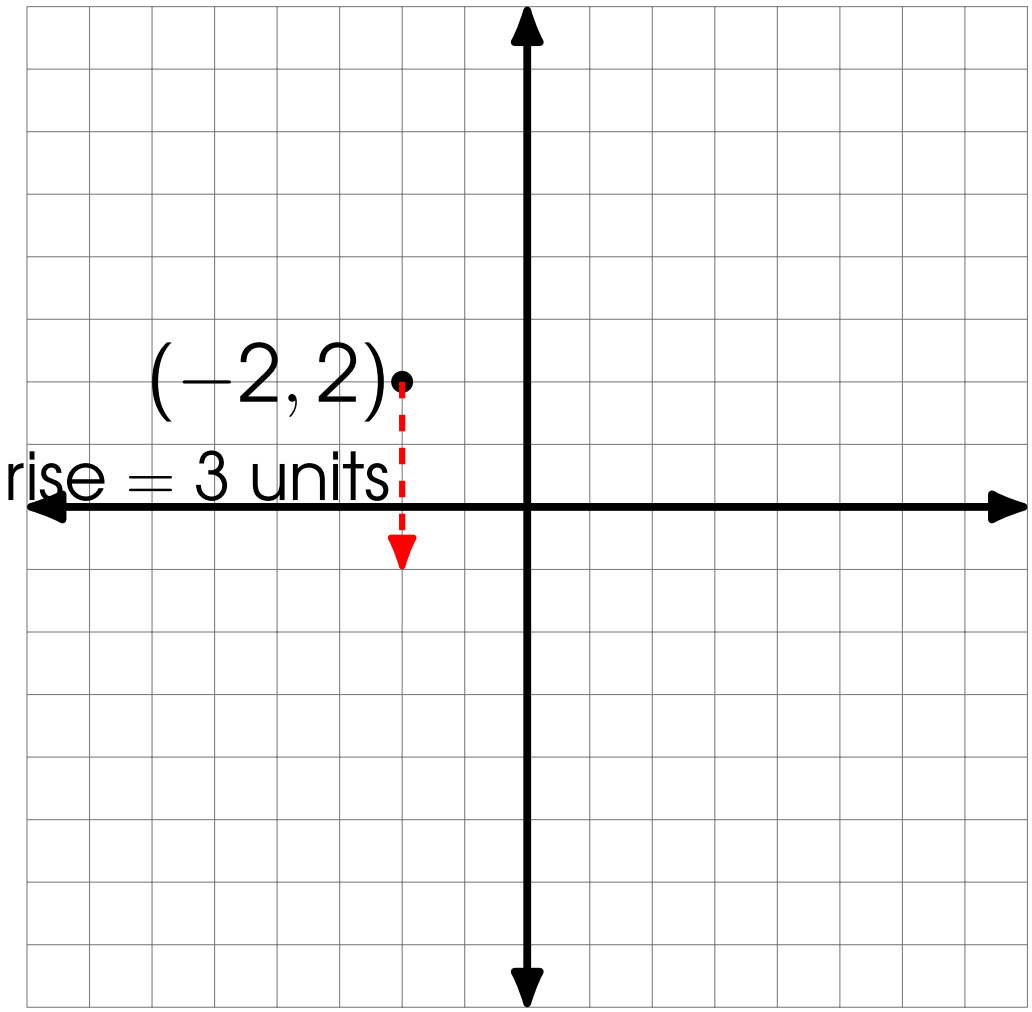

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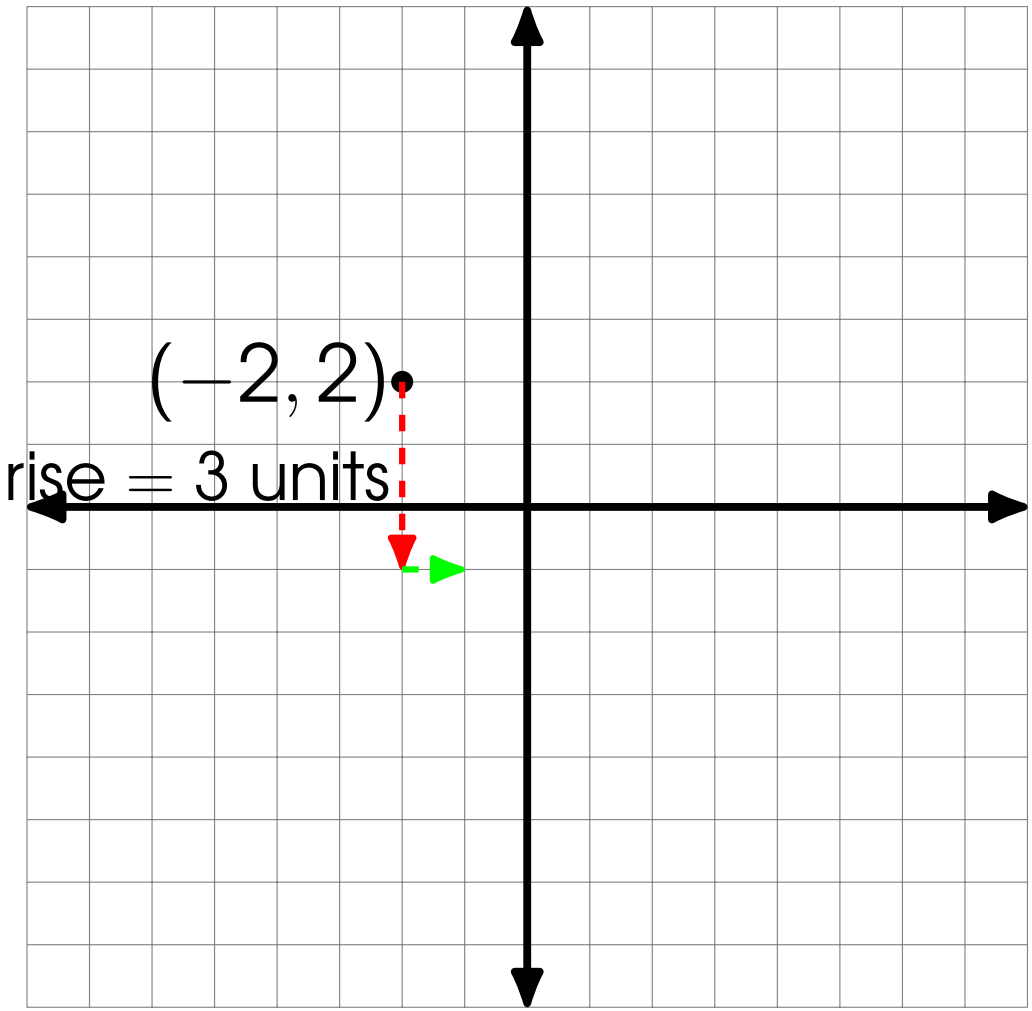

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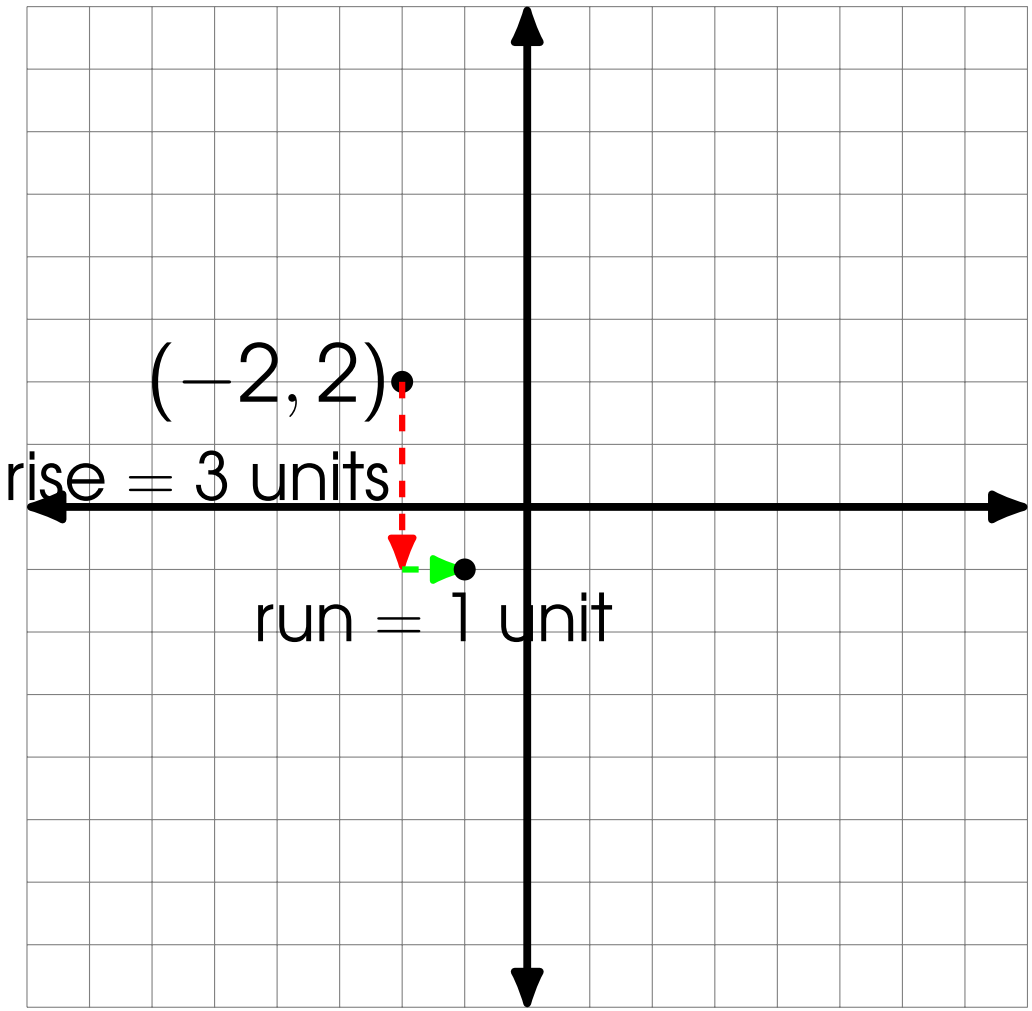

How to Graph Linear Equations Using the Slope and a Point?

1. Plot the given point.
2. Use the slope to get the other point.
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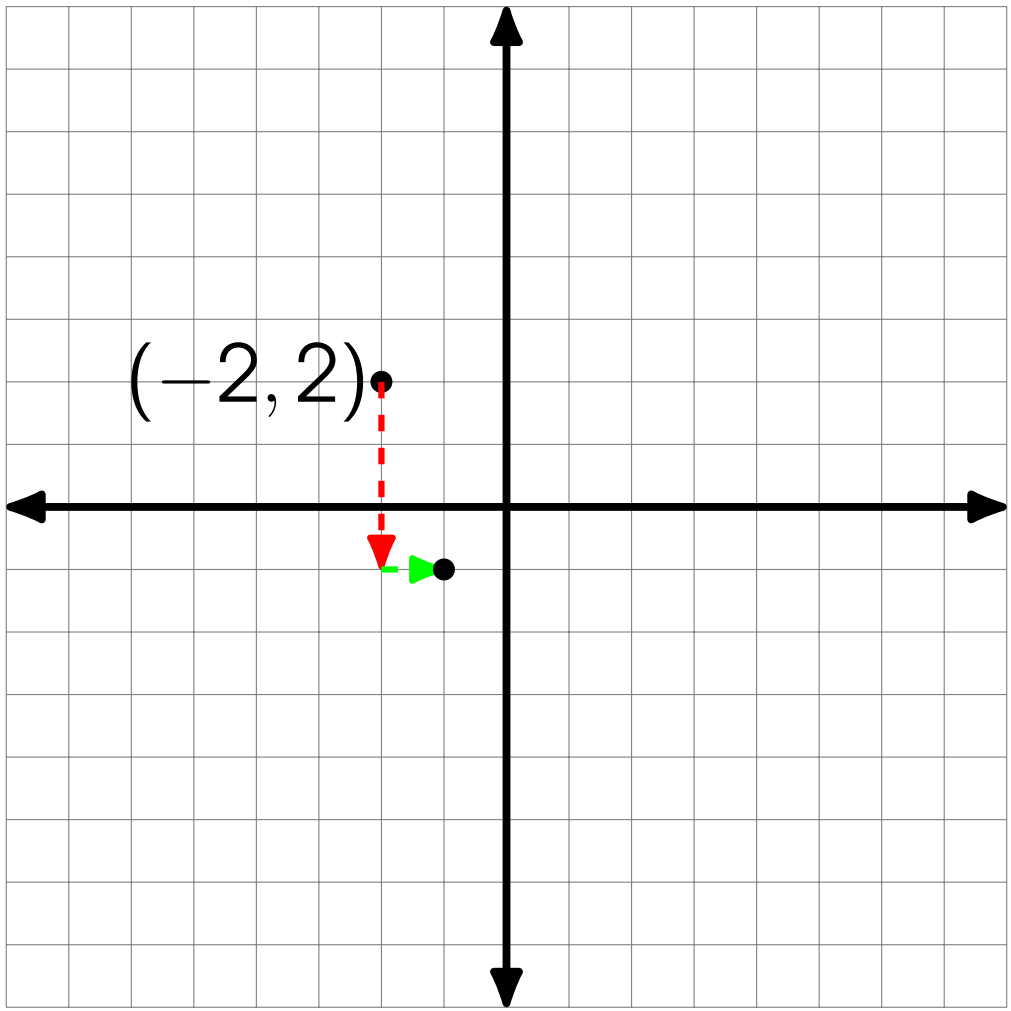
Example2

$$\text{Slope } m = \frac{\text{rise}}{\text{run}} = -3 = \frac{-3}{1}$$



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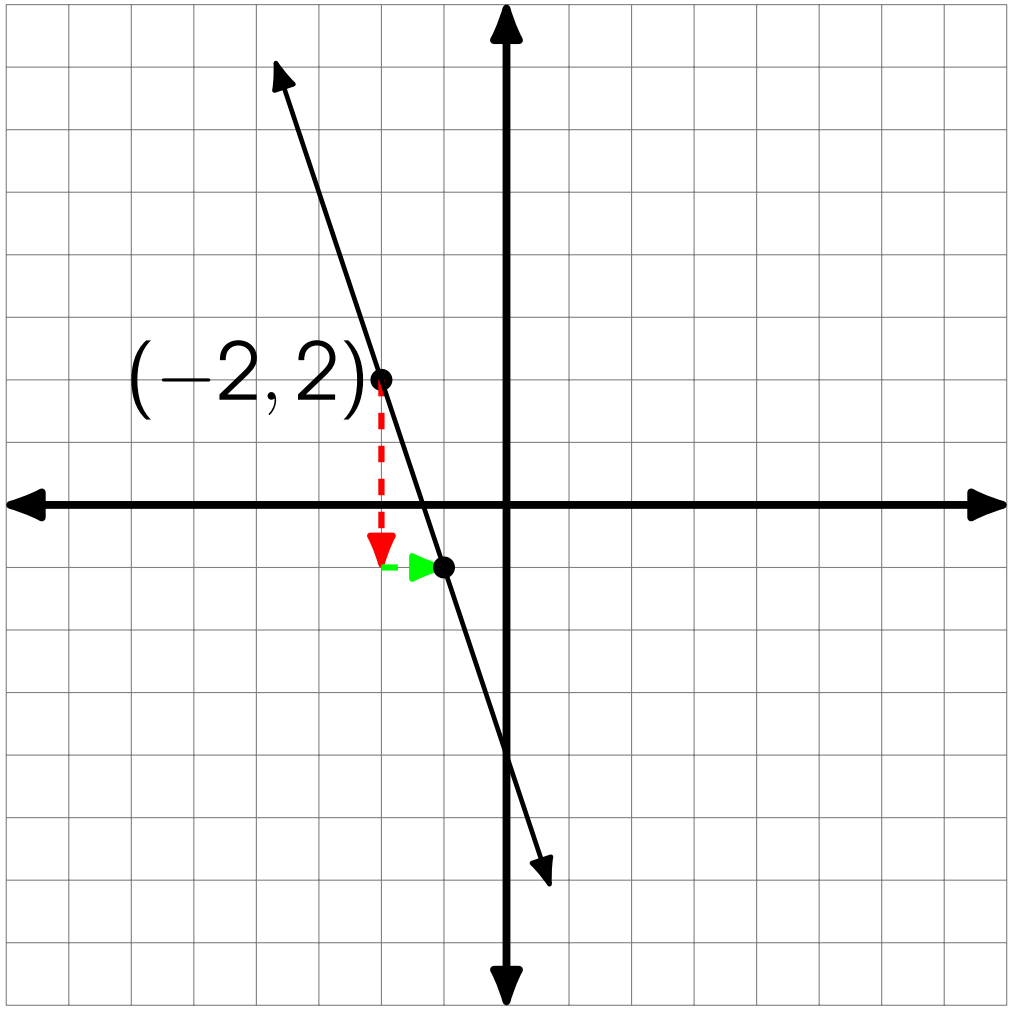

Thank you for watching.