

Lesson 4.4 Sketching Graphs of Linear Equations

Graph a linear equation by using two or more points.

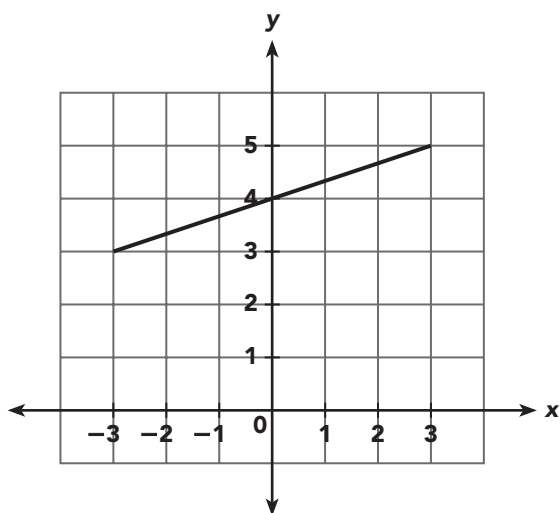
Example

Graph the equation $y = \frac{1}{3}x + 4$.

STEP 1 Construct a table of values. Choose three values for x and solve to find corresponding values for y .

x	-3	0	3
y	3	4	5

STEP 2 Graph the equation using the table of values.



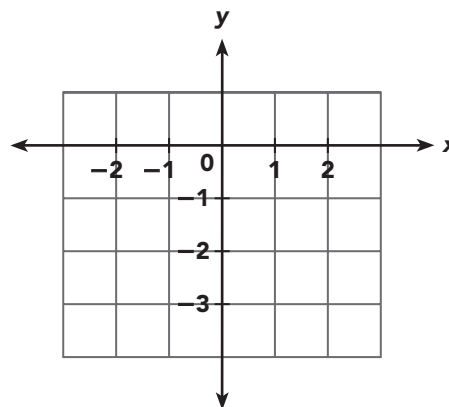
Choose 0 and multiples of 3 for values of x because of $\frac{1}{3}x$ in the equation.



Complete.

1. Graph the equation $y = \frac{1}{2}x - 1$.

x	-2	0	2
y			

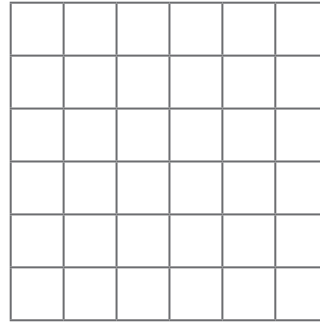


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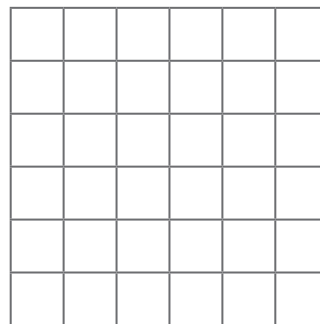
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Graph each linear equation by using two or more points.

2. $y = \frac{2}{5}x + 2$



3. $y = \frac{5}{3}x - 4$



Graph of a linear equation by using m and b .

Example

Graph the equation $y = 2x + 3$.

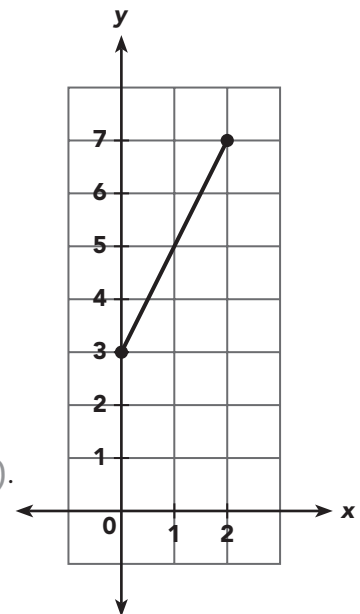
STEP 1 $y = 2x + 3$ has y -intercept $b = \underline{3}$. So, it passes through the point $(\underline{0}, \underline{3})$. Plot the point $(0,3)$ on the graph.

STEP 2 The slope of the line is 2, so the ratio $\frac{\text{Rise}}{\text{Run}} = \underline{2}$. Use the slope to find another point on the graph.

$$\text{Slope} = 2 = \frac{2}{1} = \frac{4}{2} = \frac{6}{3} = \dots$$

Using $\frac{4}{2}$, you can move up 4 units and then over 2 units to the right to plot a point at $(\underline{2}, \underline{7})$.

STEP 3 Use a ruler and draw a line through the points. This line is the graph of the equation $\underline{y = 2x + 3}$.



Name: _____

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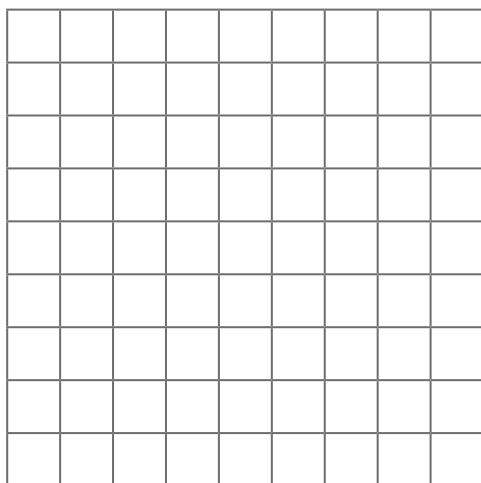
Complete.

4. Graph the equation $y = -\frac{1}{2}x + 3$. Use 1 grid square to represent 1 unit on both axes for each interval.

STEP 1 $y = -\frac{1}{2}x + 3$ has y-intercept $b =$ _____.

So, it passes through the point (_____, _____).

Plot the point (_____, _____) on the graph.



STEP 2 The slope of the line is $-\frac{1}{2}$, so the ratio $\frac{\text{Rise}}{\text{Run}} = \frac{\boxed{}}{\boxed{}}$.

Use the slope to find another point on the graph.

Slope = _____ = $\frac{-1}{2} = \frac{1}{-2} = \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}} = \dots$

Using _____, you can move down _____ units and then over _____ units to the right to plot a point at (_____, _____).

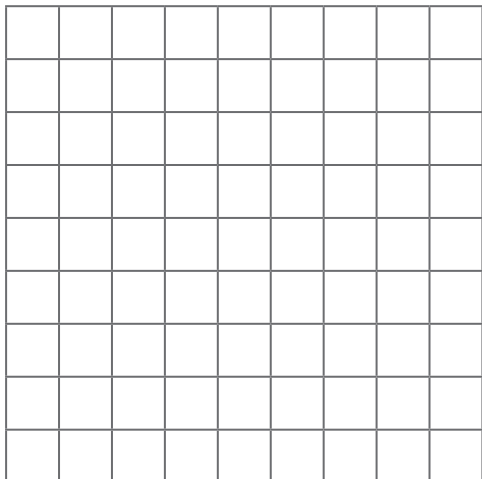
STEP 3 Use a ruler and draw a line through the points. This line is the graph of the equation _____.

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Graph. Use 1 grid square to represent 1 unit on both axes for each interval.

5. Graph the equation $y = -x + 4$.



Graph of a linear equation given m and a point.

Example

Graph a line with slope 3 that passes through the point (1, 2).

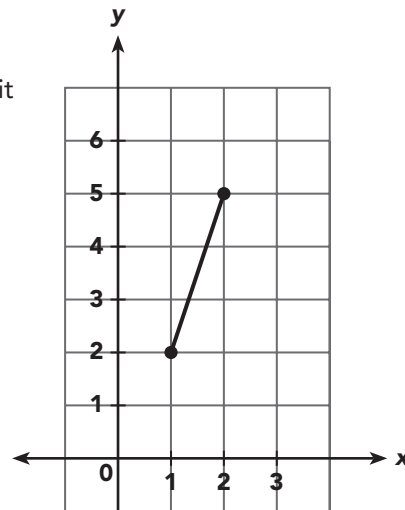
STEP 1 Plot the given point (1, 2).

STEP 2 The slope of the line is 3, so the ratio $\frac{\text{Rise}}{\text{Run}} = \underline{3}$.
Use the slope to find another point on the graph.

$$\text{Slope} = 3 = \frac{3}{1} = \frac{6}{2} = \frac{9}{3} = \dots$$

Using $\frac{3}{1}$, move up 3 units and then over 1 unit to the right to plot a point at (2, 5).

STEP 3 Use a ruler and draw a line through the points.
This is the line with slope 3 that passes through the point (1, 2).



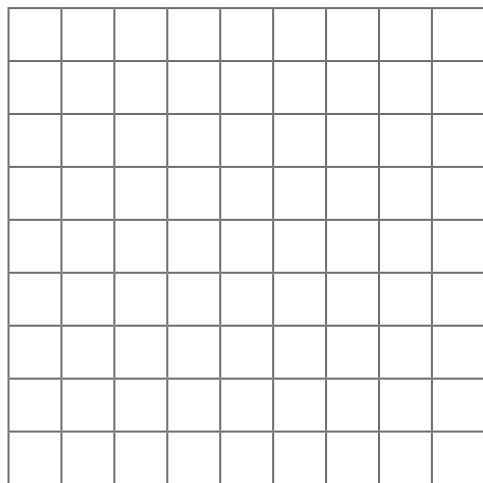
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Complete.

6. Graph a line with slope -1 that passes through the point $(-2, 3)$. Use 1 grid square to represent 1 unit on both axes for each interval.

STEP 1 Plot the point (_____, _____) on the graph.



STEP 2 The slope of the line is _____, so the ratio $\frac{\text{Rise}}{\text{Run}} = \frac{\boxed{}}{\boxed{}}$.

$$\text{Slope} = \text{_____} = \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}} = \dots$$

Using _____, you can move down _____ units and then over _____ units to the right to plot a point at (_____, _____).

STEP 3 Use a ruler and draw a line through the points.

Graph the linear equation.

7. Graph a line with slope $\frac{1}{2}$ that passes through the point $(-1, -2)$. Use 1 grid square to represent 1 unit on both axes for each interval.

