

## Graphing Linear Equations

Answer key

HSF.IF.C.7

14 problems

1. Give the slope and  $y$ -intercept of  $y = 2x + 3$ .

**Answer** Slope 2;  $y$ -intercept  $(0, 3)$

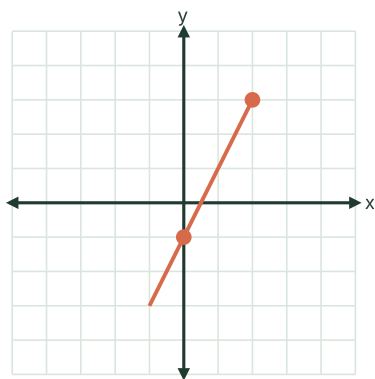
In  $y = mx + b$ ,  $m = 2$  and  $b = 3$ , so the line crosses the  $y$ -axis at  $(0, 3)$ .

2. Give the slope and  $y$ -intercept of  $y = -3x + 5$ .

**Answer** Slope  $-3$ ;  $y$ -intercept  $(0, 5)$

Here  $m = -3$  and  $b = 5$ , so the  $y$ -intercept is  $(0, 5)$ .

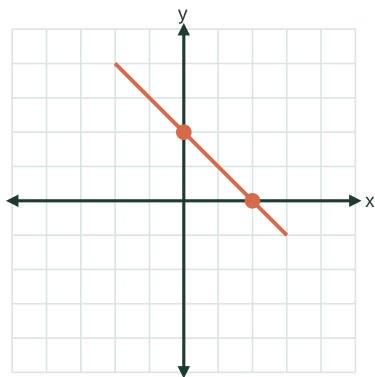
3. Read the equation of the line drawn on the grid. Write it in the form  $y = mx + b$ .



**Answer**  $y = 2x - 1$

The line crosses the  $y$ -axis at  $(0, -1)$ , so  $b = -1$ . From  $(0, -1)$  to  $(2, 3)$  is up 4, right 2:  $m = \frac{4}{2} = 2$ . So  $y = 2x - 1$ .

4. Read the equation of the line drawn on the grid. Write it in the form  $y = mx + b$ .



**Answer**  $y = -x + 2$

The line crosses the  $y$ -axis at  $(0, 2)$ , so  $b = 2$ . From  $(0, 2)$  to  $(2, 0)$  is down 2, right 2:  $m = \frac{-2}{2} = -1$ . So  $y = -x + 2$ .

5. A line has slope  $\frac{3}{4}$  and  $y$ -intercept  $-2$ . Write its equation, then list the two points you would plot first to graph it.

**Answer**  $y = \frac{3}{4}x - 2$ ; plot  $(0, -2)$  and  $(4, 1)$

Start at  $(0, -2)$ . From there, rise 3 and run 4 to reach  $(4, 1)$ .

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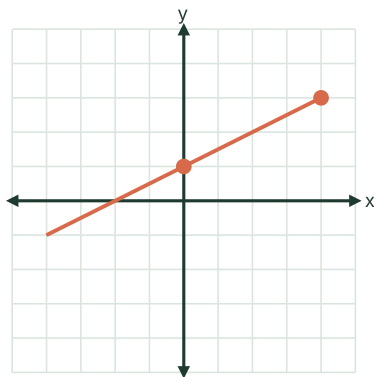
6. Rewrite  $2x + y = 6$  in slope-intercept form, then state the slope and  $y$ -intercept.

**Answer**  $y = -2x + 6$ ; slope  $-2$ ,  $y$ -intercept  $(0, 6)$

Subtract  $2x$ :  $y = -2x + 6$ . So  $m = -2$  and  $b = 6$ .

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7. Read the equation of the line drawn on the grid. Write it in the form  $y = mx + b$ .



**Answer**  $y = \frac{1}{2}x + 1$

The line crosses the  $y$ -axis at  $(0, 1)$ , so  $b = 1$ . From  $(0, 1)$  to  $(4, 3)$  is up 2, right 4:  $m = \frac{2}{4} = \frac{1}{2}$ . So  $y = \frac{1}{2}x + 1$ .

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8. Rewrite  $3x - 4y = 12$  in slope-intercept form, then state the slope and  $y$ -intercept.

**Answer**  $y = \frac{3}{4}x - 3$ ; slope  $\frac{3}{4}$ ,  $y$ -intercept  $(0, -3)$

$-4y = -3x + 12$ , so  $y = \frac{3}{4}x - 3$ . Thus  $m = \frac{3}{4}$  and  $b = -3$ .

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9. Find the  $x$ -intercept of the line  $2x + 5y = 10$ .

**Answer**  $(5, 0)$

Set  $y = 0$ :  $2x = 10$ , so  $x = 5$ . The  $x$ -intercept is  $(5, 0)$ .

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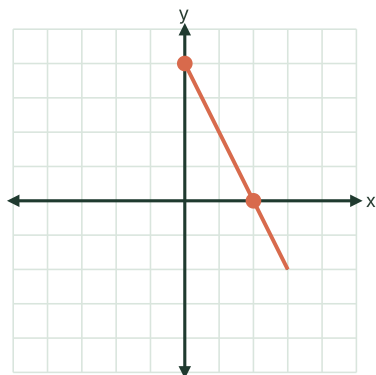
10. Find both intercepts of  $4x + 3y = 12$ , then describe how to use them to graph the line.

**Answer**  $x$ -intercept  $(3, 0)$ ;  $y$ -intercept  $(0, 4)$

Set  $y = 0$ :  $4x = 12 \Rightarrow x = 3$ , giving  $(3, 0)$ . Set  $x = 0$ :  $3y = 12 \Rightarrow y = 4$ , giving  $(0, 4)$ . Plot both and draw the line.

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11. Identify the equation of the line drawn on the grid, then rewrite it in standard form  $Ax + By = C$ .



**Answer**  $y = -2x + 4$ , or  $2x + y = 4$

The line crosses the  $y$ -axis at  $(0, 4)$  and the  $x$ -axis at  $(2, 0)$ . Slope  $= \frac{0 - 4}{2 - 0} = -2$ , so  $y = -2x + 4$ . Add  $2x$  to get  $2x + y = 4$ .

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12. Write the equation, in slope-intercept form, of the line with slope  $\frac{2}{3}$  that passes through  $(0, -4)$ .

**Answer**  $y = \frac{2}{3}x - 4$

The point  $(0, -4)$  is the  $y$ -intercept, so  $b = -4$ , and  $m = \frac{2}{3}$ . Thus  $y = \frac{2}{3}x - 4$ .

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13. Write the equation of the horizontal line that passes through  $(-2, -3)$ , and state its slope.

**Answer**  $y = -3$ ; slope 0

A horizontal line has every point at the same height,  $y = -3$ , and slope 0.

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14. Which equation is graphed by a line with slope 2 that passes through the point  $(0, -1)$ ?

**Answer B)**  $y = 2x - 1$

Slope 2 gives  $m = 2$ ; passing through  $(0, -1)$  gives  $b = -1$ . So  $y = 2x - 1$ .