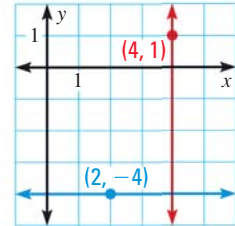


HORIZONTAL AND VERTICAL LINES Recall that equations of horizontal lines have the form $y = a$. Equations of vertical lines have the form $x = b$. You cannot write an equation for a vertical line in slope-intercept form or point-slope form, because a vertical line has no slope. However, you can write an equation for a vertical line in standard form.

EXAMPLE 3 Write an equation of a line

Write an equation of the specified line.

- a. Blue line b. Red line



Solution

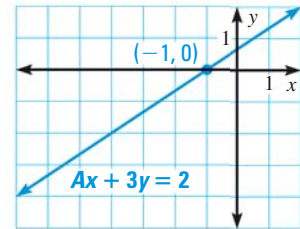
- a. The y -coordinate of the given point on the blue line is -4 . This means that all points on the line have a y -coordinate of -4 . An equation of the line is $y = -4$.
- b. The x -coordinate of the given point on the red line is 4 . This means that all points on the line have an x -coordinate of 4 . An equation of the line is $x = 4$.

ANOTHER WAY

Using the slope-intercept form to find an equation of the horizontal line gives you $y = 0x - 4$, or $y = -4$.

EXAMPLE 4 Complete an equation in standard form

Find the missing coefficient in the equation of the line shown. Write the completed equation.



Solution

STEP 1 Find the value of A . Substitute the coordinates of the given point for x and y in the equation. Solve for A .

$$\begin{aligned} Ax + 3y &= 2 && \text{Write equation.} \\ A(-1) + 3(0) &= 2 && \text{Substitute } -1 \text{ for } x \text{ and } 0 \text{ for } y. \\ -A &= 2 && \text{Simplify.} \\ A &= -2 && \text{Divide by } -1. \end{aligned}$$

STEP 2 Complete the equation.

$$-2x + 3y = 2 \quad \text{Substitute } -2 \text{ for } A.$$

GUIDED PRACTICE for Examples 3 and 4

Write equations of the horizontal and vertical lines that pass through the given point.

3. $(-8, -9)$ 4. $(13, -5)$

Find the missing coefficient in the equation of the line that passes through the given point. Write the completed equation.

5. $-4x + By = 7, (-1, 1)$ 6. $Ax + y = -3, (2, 11)$