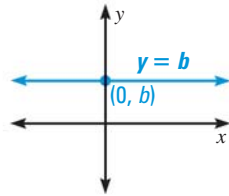
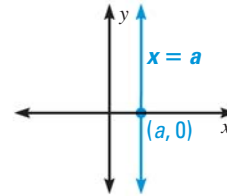


## Equations of Horizontal and Vertical Lines



The graph of  $y = b$  is a horizontal line. The line passes through the point  $(0, b)$ .



The graph of  $x = a$  is a vertical line. The line passes through the point  $(a, 0)$ .



## GUIDED PRACTICE for Examples 2 and 3

Graph the equation.

2.  $y + 3x = -2$

3.  $y = 2.5$

4.  $x = -4$

**LINEAR FUNCTIONS** In Example 3,  $y = 2$  is a function, while  $x = -1$  is not a function. The equation  $Ax + By = C$  represents a **linear function** provided  $B \neq 0$  (that is, provided the graph of the equation is not a vertical line). If the domain of a linear function is not specified, it is understood to be all real numbers. The domain can be restricted, as shown in Example 4.

## EXAMPLE 4 Graph a linear function

Graph the function  $y = -\frac{1}{2}x + 4$  with domain  $x \geq 0$ . Then identify the range of the function.

**Solution**

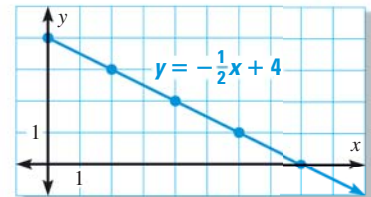
**STEP 1** Make a table.

$x$	0	2	4	6	8
$y$	4	3	2	1	0

**STEP 2** Plot the points.

**STEP 3** Connect the points with a ray because the domain is restricted.

**STEP 4** Identify the range. From the graph, you can see that all points have a  $y$ -coordinate of 4 or less, so the range of the function is  $y \leq 4$ .



## ANALYZE A FUNCTION

The function in Example 4 is called a *continuous* function. To learn about continuous functions, see p. 223.



## GUIDED PRACTICE for Example 4

5. Graph the function  $y = -3x + 1$  with domain  $x \leq 0$ . Then identify the range of the function.