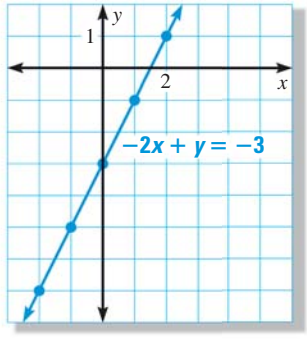
EXAMPLE 2 Graph an equation

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

Solution



STEP 1 **Solve** the equation for y.

$$-2x + y = -3$$

$$y = 2x - 3$$

STEP 2 **Make** a table by choosing a few values for x and finding the values of y.

x	−2	−1	0	1	2
y	−7	−5	−3	−1	1

DRAW A GRAPH
If you continued to find solutions of the equation and plotted them, the line would fill in.

STEP 3 **Plot** the points. Notice that the points appear to lie on a line.

STEP 4 **Connect** the points by drawing a line through them. Use arrows to indicate that the graph goes on without end.

LINEAR EQUATIONS A **linear equation** is an equation whose graph is a line, such as the equation in Example 2. The **standard form** of a linear equation is

$$Ax + By = C$$

where A, B, and C are real numbers and A and B are not both zero.

Consider what happens when $A = 0$ or when $B = 0$. When $A = 0$, the equation becomes $By = C$, or $y = \frac{C}{B}$. Because $\frac{C}{B}$ is a constant, you can write $y = b$. Similarly, when $B = 0$, the equation becomes $Ax = C$, or $x = \frac{C}{A}$, and you can write $x = a$.

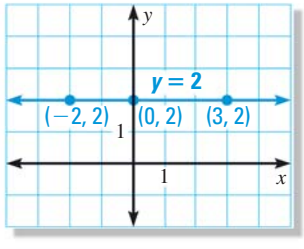
EXAMPLE 3 Graph $y = b$ and $x = a$

Graph (a) $y = 2$ and (b) $x = -1$.

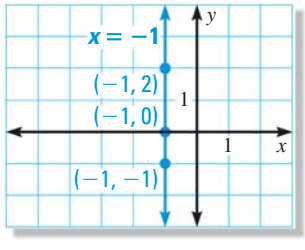
Solution

FIND A SOLUTION
The equations $y = 2$ and $0x + 1y = 2$ are equivalent. For any value of x, the ordered pair $(x, 2)$ is a solution of $y = 2$.

a. For every value of x, the value of y is 2. The graph of the equation $y = 2$ is a horizontal line 2 units above the x-axis.



b. For every value of y, the value of x is −1. The graph of the equation $x = -1$ is a vertical line 1 unit to the left of the y-axis.



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