ACTIVITY 4.6
Using Technology

Graphing Calculator Activity for use with Lesson 4.6

Graphing a Linear Equation

In Lesson 4.6 you learned how to graph a linear equation using the slope and the *y*-intercept. With a graphing calculator or a computer, you can graph a linear equation and find solutions.

EXAMPLE 1

Use a graphing calculator to graph $2x - 3y = 33$.

STUDENT HELP

INTERNET KEYSTROKE HELP

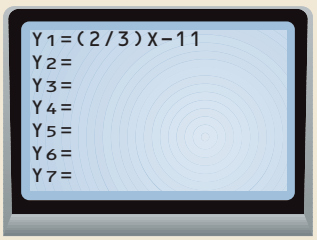
See keystrokes for several models of calculators at www.mcdougallittell.com

SOLUTION

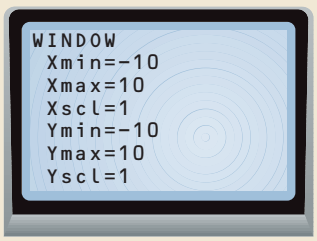
1 Rewrite the equation in terms of x and y if necessary. Then solve the equation for y.

$$2x - 3y = 33$$
$$-3y = -2x + 33$$
$$y = \frac{2}{3}x - 11$$

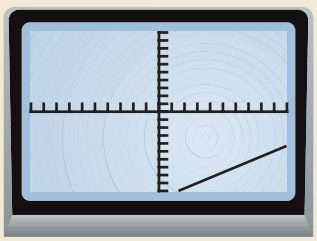
2 Press Y= (2 ÷ 3) x − 11 ENTER . Without parentheses, the calculator may interpret the fraction as $\frac{2}{3x}$.



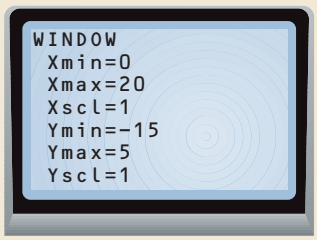
3 Think of the screen as a "window" that lets you look at part of a coordinate plane. Press WINDOW to set the size of the graph.

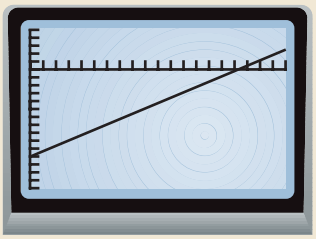


4 Press GRAPH to graph the equation. A standard viewing window is shown.



5 To see the point where the graph crosses the x-axis, you can adjust the viewing window. Press WINDOW and enter new values. Then press GRAPH to graph the equation.



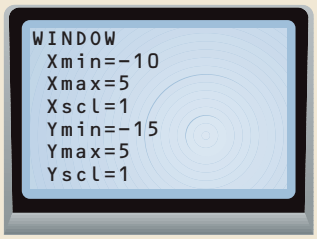


EXAMPLE 2

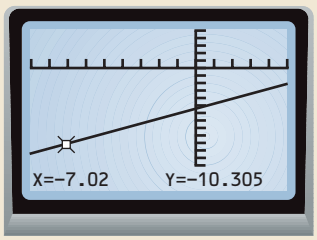
Estimate the value of y when $x = -7$ in the equation $y = \frac{2}{3}x - \frac{45}{8}$.

SOLUTION

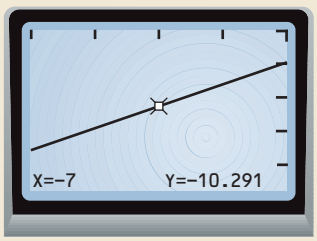
1 Graph the equation $y = \frac{2}{3}x - \frac{45}{8}$ using a viewing window that will show the graph when $x \approx -7$.



2 Press TRACE and a flashing cursor appears. The x-coordinate and y-coordinate of the cursor's location are at the bottom of the screen. Press right and left arrows to move it. Move the trace cursor until the x-coordinate of the point is at about -7.



3 Use the ZOOM feature to get a more accurate estimate. A common way to zoom is to press ZOOM and select *Zoom In*. You now have a closer look at the graph at that point. Repeat **Step 2**.



When $x = -7$, $y \approx -10.3$.

STUDENT HELP

Study Tip

You can continue to use zoom until the y-coordinate is to the nearest tenth, hundredth, or any other decimal place you need.

EXERCISES

Use the standard viewing window to graph the equation.

1. $y = -2x - 3$ **2.** $y = 2x + 2$ **3.** $x + 2y = -1$ **4.** $x - 3y = 3$

Use the indicated viewing window to graph the equation.

5. $y = x + 25$
Xmin = −10
Xmax = 10
Xscl = 1
Ymin = −5
Ymax = 35
Yscl = 5

6. $y = 0.1x$
Xmin = −10
Xmax = 10
Xscl = 1
Ymin = −5
Ymax = 1
Yscl = 0.1

7. $y = 100x + 2500$
Xmin = 0
Xmax = 100
Xscl = 10
Ymin = 0
Ymax = 15000
Yscl = 1000

Determine an appropriate viewing window for the graph of the equation.

8. $y = x - 330$ **9.** $y = x - 0.3$ **10.** $y = 120x$ **11.** $y = 40{,}000 - 1500x$

Use a graph of the equation to estimate the value of *y* for the given value of *x*.

12. $y = -9x$ when $x = -1.05$

13. $y = 5x + 651$ when $x = 2.3$

14. $y + \frac{1}{3}x = \frac{1}{5}$ when $x = 19$

15. $y = -2x - 3$ when $x = 954$