ACTIVITY 3.5

Using Technology

Graphing Calculator Activity for use with Lesson 3.5

Graphing Linear Equations in Three Variables

Some graphing calculators can be used to graph a linear equation in three variables. The instructions for graphing on a TI-92 are given below.

MATERIALS

TI-92 graphing calculator or computer with 3-D graphing software

STUDENT HELP

INTERNET KEYSTROKE HELP

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

EXAMPLE

Use a graphing calculator (or a computer) to graph the equation $3x + 5y + 6z = 30$.

SOLUTION

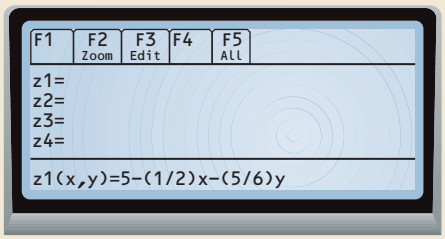
1 Solve the equation for z.

$3x + 5y + 6z = 30$ **Write equation.**

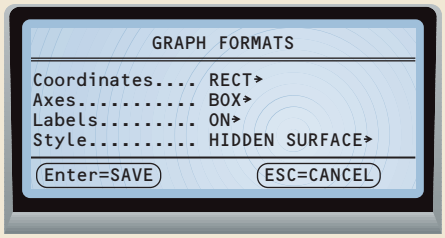
$6z = 30 - 3x - 5y$ **Isolate the z-term.**

$z = 5 - \frac{1}{2}x - \frac{5}{6}y$ **Solve for z.**

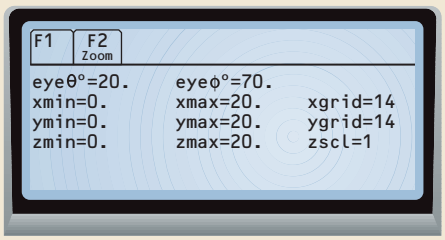
2 Enter the equation in the [Z=] editor.



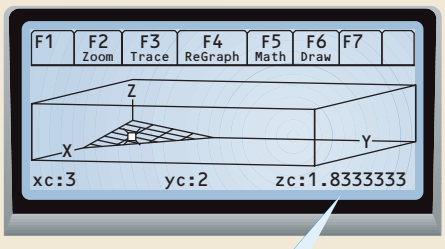
3 Display the axes in box format and turn the labels on.



4 Set the window values as shown.



5 Graph the equation. You can use the *Evaluate* feature to evaluate z for values of x and y.



When $x = 3$ and $y = 2$, $z \approx 1.83$.

EXERCISES

Use a graphing calculator (or a computer) to graph the equation. Then evaluate z for the given values of x and y.

1. $4x + 18y + 3z = 54$; $x = 6$, $y = 4$

2. $3x + y + z = 24$; $x = 1.5$, $y = 19$

3. $x + 3y + 10z = 45$; $x = 20$, $y = 7$

4. $7x + 6y + 2z = 61$; $x = 4$, $y = 4$

5. $4x + 13y - 5z = 26$; $x = 14$, $y = 6$

6. $3x - 25y + 20z = 35$; $x = 5$, $y = 0$