EXAMPLE 4 Use a line of fit to make a prediction

Use the equation of the line of fit from Example 3 to predict the number of alternative-fueled vehicles in use in the United States in 2010.

Solution

Because 2010 is 13 years after 1997, substitute 13 for x in the equation from Example 3.

$$y = 41.3x + 259 = 41.3(13) + 259 \approx 796$$

▶ You can predict that there will be about 796,000 alternative-fueled vehicles in use in the United States in 2010.

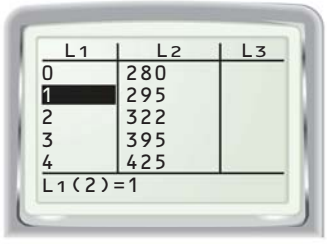
LINEAR REGRESSION Many graphing calculators have a *linear regression* feature that can be used to find the best-fitting line for a set of data.

EXAMPLE 5 Use a graphing calculator to find a best-fitting line

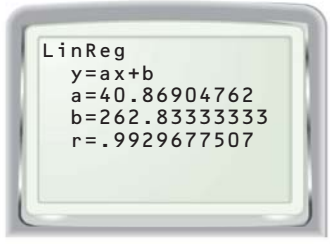
Use the *linear regression* feature on a graphing calculator to find an equation of the best-fitting line for the data in Example 3.

Solution

STEP 1 **Enter** the data into two *lists*. Press STAT and then select Edit. Enter years since 1997 in L_1 and number of alternative-fueled vehicles in L_2.

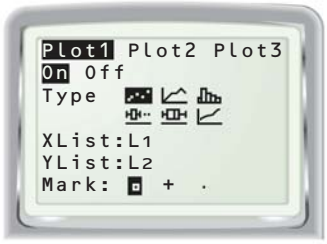


STEP 2 **Find** an equation of the best-fitting (linear regression) line. Press STAT, choose the CALC menu, and select LinReg(ax+b). The equation can be rounded to $y = 40.9x + 263$.

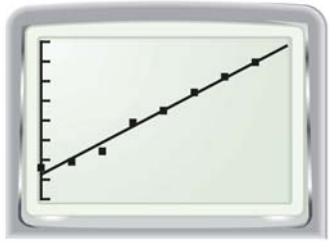


FIND CORRELATION
If your calculator does not display the correlation coefficient r when it displays the regression equation, you may need to select DiagnosticOn from the CATALOG menu.

STEP 3 **Make** a scatter plot of the data pairs to see how well the regression equation models the data. Press 2nd [STAT PLOT] to set up your plot. Then select an appropriate window for the graph.



STEP 4 **Graph** the regression equation with the scatter plot by entering the equation $y = 40.9x + 263$. The graph (displayed in the window $0 \le x \le 8$ and $200 \le y \le 600$) shows that the line fits the data well.



▶ An equation of the best-fitting line is $y = 40.9x + 263$.