KEY CONCEPT *For Your Notebook*

Approximating a Best-Fitting Line

STEP 1 **Draw** a scatter plot of the data.

STEP 2 **Sketch** the line that appears to follow most closely the trend given by the data points. There should be about as many points above the line as below it.

STEP 3 **Choose** two points on the line, and estimate the coordinates of each point. These points do not have to be original data points.

STEP 4 **Write** an equation of the line that passes through the two points from Step 3. This equation is a model for the data.

EXAMPLE 3 Approximate a best-fitting line

ALTERNATIVE-FUELED VEHICLES The table shows the number y (in thousands) of alternative-fueled vehicles in use in the United States x years after 1997. Approximate the best-fitting line for the data.

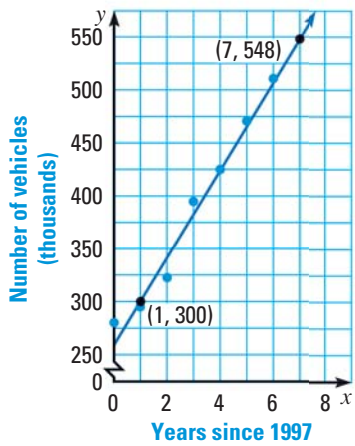
x	0	1	2	3	4	5	6	7
y	280	295	322	395	425	471	511	548

Solution

STEP 1 **Draw** a scatter plot of the data.

STEP 2 **Sketch** the line that appears to best fit the data. One possibility is shown.

STEP 3 **Choose** two points that appear to lie on the line. For the line shown, you might choose (1, 300), which is not an original data point, and (7, 548), which is an original data point.



STEP 4 **Write** an equation of the line. First find the slope using the points (1, 300) and (7, 548).

$$m = \frac{548 - 300}{7 - 1} = \frac{248}{6} \approx 41.3$$

Use point-slope form to write the equation. Choose $(x_1, y_1) = (1, 300)$.

$y - y_1 = m(x - x_1)$ **Point-slope form**

$y - 300 = 41.3(x - 1)$ **Substitute for m, x_1, and y_1.**

$y \approx 41.3x + 259$ **Simplify.**

▶ An approximation of the best-fitting line is $y = 41.3x + 259$.

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