

EXAMPLE 4 Find the zero of a function

SOFTBALL Look back at Example 3. Find the zero of the function. *Explain* what the zero means in this situation.

Solution

Substitute 0 for y in the equation of the best-fitting line and solve for x .

$$y = -0.02x + 1.435 \quad \text{Write the equation.}$$

$$0 = -0.02x + 1.435 \quad \text{Substitute 0 for } y.$$

$$x \approx 72 \quad \text{Solve for } x.$$

► The zero of the function is about 72. The function has a negative slope, which means that the number of youth softball participants is decreasing. According to the model, there will be no youth softball participants 72 years after 1997, or in 2069.



GUIDED PRACTICE for Example 4

3. **JET BOATS** The number y (in thousands) of jet boats purchased in the U.S. can be modeled by the function $y = -1.23x + 14$ where x is the number of years since 1995. Find the zero of the function. *Explain* what the zero means in this situation.

5.7 EXERCISES

HOMEWORK KEY

- = **WORKED-OUT SOLUTIONS**
on p. WS1 for Exs. 3 and 19
- = **TAKS PRACTICE AND REASONING**
Exs. 14, 16, 21, 24, and 25
- = **MULTIPLE REPRESENTATIONS**
Exs. 22

SKILL PRACTICE

- VOCABULARY** Copy and complete: Using a linear function to approximate a value within a range of known data values is called ?.
- WRITING** *Explain* how extrapolation differs from interpolation.

EXAMPLE 1

on p. 335
for Exs. 3–4

LINEAR INTERPOLATION Make a scatter plot of the data. Find the equation of the best-fitting line. Approximate the value of y for $x = 5$.

3.

x	0	2	4	6	7
y	2	7	14	17	20

4.

x	2	4	6	8	10
y	6.2	22.5	40.2	55.4	72.1

EXAMPLE 2

on p. 336
for Exs. 5–6

LINEAR EXTRAPOLATION Make a scatter plot of the data. Find the equation of the best-fitting line. Approximate the value of y for $x = 10$.

5.

x	0	1	2	3	4
y	20	32	39	53	63

6.

x	1	3	5	7	9
y	0.4	1.4	1.9	2.3	3.2