EXAMPLE 7 Use an inverse power model to make a prediction

Use the inverse power model from Example 6 to predict the year when the average ticket price will reach $58.

Solution

$$t = \left(\frac{P}{35}\right)^{5.2} \qquad \text{Write inverse power model.}$$

$$= \left(\frac{58}{35}\right)^{5.2} \qquad \text{Substitute 58 for } P.$$

$$\approx 14 \qquad \text{Use a calculator.}$$

▶ You can predict that the average ticket price will reach $58 about 14 years after 1995, or in 2009.

✓ **GUIDED PRACTICE** for Examples 6 and 7

11. **TICKET PRICES** The average price P (in dollars) for a Major League Baseball ticket can be modeled by $P = 10.7t^{0.272}$ where t is the number of years since 1995. Write the inverse model. Then use the inverse to predict the year when the average ticket price will reach $25.

6.4 EXERCISES

SKILL PRACTICE

1. **VOCABULARY** State the definition of an inverse relation.

2. **WRITING** *Explain* how to determine whether a function g is an inverse of f.

EXAMPLE 1
on p. 438
for Exs. 3–13

INVERSE RELATIONS Find an equation for the inverse relation.

3. $y = 4x - 1$

4. $y = -2x + 5$

5. $y = 7x - 6$

6. $y = 10x - 28$

7. $y = 12x + 7$

8. $y = -18x - 5$

9. $y = 5x + \frac{1}{3}$

10. $y = -\frac{2}{3}x + 2$

11. $y = -\frac{3}{5}x + \frac{7}{5}$

ERROR ANALYSIS *Describe* and correct the error in finding the inverse of the relation.

12.
$$y = 6x - 11$$
$$x = 6y - 11$$
$$x + 11 = 6y$$
$$\frac{x}{6} + 11 = y \qquad ✗$$

13.
$$y = -x + 3$$
$$-x = y + 3$$
$$-x - 3 = y \qquad ✗$$