

## PROBLEM SOLVING

### EXAMPLE 3

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for Exs. 39–41

39. **MOVIE TICKETS** The average price of a movie ticket in the United States from 1980 to 2000 can be modeled by the function  $f(x) = 0.10x + 2.75$  where  $x$  is the number of years since 1980.

- Graph the function and identify its domain and range.
- Find the value of  $x$  so that  $f(x) = 4.55$ . *Explain* what the solution means in this situation.

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40. **DVD PLAYERS** The number (in thousands) of DVD players sold in the United States from 1998 to 2003 can be modeled by  $f(x) = 4250x + 330$  where  $x$  is the number of years since 1998.

- Graph the function and identify its domain and range.
- Find the value of  $x$  so that  $f(x) = 13,080$ . *Explain* what the solution means in this situation.

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41. **IN-LINE SKATING** An in-line skater's average speed is 10 miles per hour. The distance traveled after skating for  $x$  hours is given by the function  $d(x) = 10x$ . Graph the function and identify its domain and range. How long did it take the skater to travel 15 miles? *Explain*.

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### EXAMPLE 5

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for Exs. 42–43

42. **HOME SECURITY** A home security company charges new customers \$155 for the installation of security equipment and a monthly fee of \$40. To attract more customers, the company reduces its installation fee to \$75. The functions below give the total cost for  $x$  months of service:

**Regular fee:**  $f(x) = 40x + 155$       **Reduced fee:**  $g(x) = 40x + 75$

Graph both functions. How is the graph of  $g$  related to the graph of  $f$ ?

43. **THEATERS** A ticket for a play at a theater costs \$16. The revenue (in dollars) generated from the sale of  $x$  tickets is given by  $s(x) = 16x$ . The theater managers raise the cost of tickets to \$20. The revenue generated from the sale of  $x$  tickets at that price is given by  $r(x) = 20x$ . Graph both functions. How is the graph of  $r$  related to the graph of  $s$ ?

44. **TX TAKS REASONING** The cost of supplies, such as mustard and napkins, a pretzel vendor needs for one day is \$75. Each pretzel costs the vendor \$.50 to make. The total daily cost to the vendor is given by  $C(x) = 0.5x + 75$  where  $x$  is the number of pretzels the vendor makes.

- Graph** Graph the cost function.
- Graph** The vendor sells each pretzel for \$3. The revenue is given by  $R(x) = 3x$  where  $x$  is the number of pretzels sold. Graph the function.
- Explain** The vendor's profit is the difference of the revenue and the cost. *Explain* how you could use the graphs to find the vendor's profit for any given number of pretzels made and sold.