57. *Vertical Motion* The velocity of a ball thrown vertically upward from ground level is given by $v(t) = -32t + 48$, where t is the time in seconds and v is the velocity in feet per second.
   (a) Find the velocity when $t = 1$.
   (b) Find the time when the ball reaches its maximum height. [*Hint:* Find the time when $v(t) = 0$.]
   (c) Find the velocity when $t = 2$.

58. *Dimensions of a Rectangle* A wire 24 inches long is to be cut into four pieces to form a rectangle with one side of length x.
   (a) Express the area A of the rectangle as a function of x.
   (b) Determine the domain of the function and use a graphing utility to graph the function over that domain.
   (c) Use the graph of the function to approximate the maximum area of the rectangle. Make a conjecture about the dimensions of the rectangle.

In Exercises 59–62, let $f(x) = 3 - 2x$, $g(x) = \sqrt{x}$, and $h(x) = 3x^2 + 2$. Find the indicated value.

59. $(f - g)(4)$
60. $(fh)(1)$
61. $(h \circ g)(7)$
62. $(g \circ f)(-2)$

In Exercises 63–66, (a) find f^{-1}, (b) sketch the graphs of f and f^{-1} in the same coordinate system, and (c) verify that $f^{-1}(f(x)) = x = f(f^{-1}(x))$.

63. $f(x) = \frac{1}{2}x - 3$
64. $f(x) = 5x - 7$
65. $f(x) = \sqrt{x + 1}$
66. $f(x) = x^3 + 2$

In Exercises 67–70, find a mathematical model representing the statement. (In each case, determine the constant of proportionality.)

67. F is jointly proportional to x and the square root of y. ($F = 6$ when $x = 9$ and $y = 4$.)
68. R varies inversely as the cube of x. ($R = 128$ when $x = 2$.)
69. z varies directly as the square of x and inversely as y. ($z = 16$ when $x = 5$ and $y = 2$.)
70. w varies jointly as x and y and inversely as the cube of z. ($w = \frac{44}{9}$ when $x = 12$, $y = 11$, and $z = 6$.)

71. *Domestic Motor Fuel Consumption* The table gives the average fuel consumption y in miles per gallon for cars in the United States at 5-year intervals from 1970 through 1990. The time in years is given by t, where $t = 0$ represents 1970. (Source: U.S. Highway Administration)

t	0	5	10	15	20
y	13.52	13.52	15.46	18.20	21.02

   (a) Find the least squares regression lines for the data.
   (b) Sketch a scatter plot of the data and graph the linear model you found in part (a) on the same set of axes.
   (c) Interpret the slope of each model in the context of the problem.
   (d) Use the model to estimate average fuel consumption for the year 2000.

72. *Average Hourly Wage* The table gives the average hourly wages (y_1) for workers in the mining industry and the average hourly wages (y_2) for workers in the construction industry in the United States for the years 1990 through 1993. The time in years is given by t, where $t = 0$ represents 1990. (Source: U.S. Bureau of Labor Statistics)

t	0	1	2	3
y_1	\$13.68	\$14.18	\$14.51	\$14.60
y_2	\$13.77	\$13.99	\$14.11	\$14.35

   (a) Find the least squares regression lines for mining wages versus time and construction wages versus time.
   (b) Sketch a scatter plot of the data and graph the linear models you found in part (a) on the same set of axes.
   (c) Interpret the slope of each model in the context of the problem.
   (d) Use the models to estimate the wages in each industry for the year 2000.