57. **Body-Heat Loss** The description of body-heat loss due to convection involves a coefficient of convection $K_c$, which depends on wind speed $s$ according to the equation $K_c = 4\sqrt{4s + 1}$.

a. Is $K_c$ a function of $s$?

b. What is the domain of the function defined by this equation?

c. What restrictions do the physical nature of the model put on the domain?

62. **Height of a Bullet** The height of a bullet shot into the air is given by $S(t) = -4.9t^2 + 98t + 2$, where $t$ is the number of seconds after it is shot and $S(t)$ is in meters.

a. Find $S(0)$ and interpret it.

b. Find $S(9)$, $S(10)$, and $S(11)$.

c. What appears to be happening to the bullet at 10 seconds? Evaluate the function at some additional times near 10 seconds to confirm your conclusion.

37. **Tax Burden** Using data from the Internal Revenue Service, the per capita tax burden $B$ (in hundreds of dollars) can be described by $B(t) = 20.37 + 1.83t$, where $t$ is the number of years after 1980.

a. Graph this function with technology using a viewing window with $t \geq 0$ and $B(t) \geq 0$.

b. Did the tax burden increase or decrease?

(Source: Internal Revenue Service)

44. **Cocaine Use** The percent of high school seniors during the years 1975–1996 who have ever used cocaine can be described by

$$y = 0.0094x^3 - 0.36x^2 + 3.35x + 8.53$$

where $x$ is the number of years after 1975.

a. What inputs correspond to the years 1975 through 1996?

b. What outputs for $y$ could be used to estimate the percent of seniors who have ever used cocaine?

c. Based on your answers to parts (a) and (b), choose an appropriate window and graph the equation on a graphing utility.

d. Graph the function again with a new window that gives a graph nearer the center of the screen.

e. Use this function to estimate the percent in 1990.

(Source: 1998 World Almanac)

48. **Health Insurance** The table below gives the national monthly health insurance premiums paid by employers and employees for the years 2000–2004.

<table>
<thead>
<tr>
<th>Years</th>
<th>Monthly Premiums ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>379.72</td>
</tr>
<tr>
<td>2001</td>
<td>401.20</td>
</tr>
<tr>
<td>2002</td>
<td>448.66</td>
</tr>
<tr>
<td>2003</td>
<td>485.42</td>
</tr>
<tr>
<td>2004</td>
<td>547.29</td>
</tr>
</tbody>
</table>

(Source: www.eip.sc.gov)

35. **Marijuana Use** The percent $p$ of high school seniors using marijuana daily can be related to $x$, the number of years after 1990, by the equation $30p - 19x = 30$.

a. Find the $x$-intercept of the graph of this function.

b. Find and interpret the $p$-intercept of the graph of this function.

c. Graph the function, using the intercepts. What values of $x$ on the graph represent years 1990 and after?

40. **Cigarette Use** For the years 1975–1991, the percent $p$ of high school seniors who have tried cigarettes can be modeled by $p = 75.4509 - 0.7069t$, where $t$ is the number of years after 1975.

a. Is the rate of change of the percent positive or negative?

b. What does the answer to part (a) tell us about the percent of seniors who tried cigarettes during this period?

52. **Men in the Workforce** The number of men in the workforce (in millions) for the years from 1890 to 1990 can be approximated by the linear model determined by connecting the points (1890, 18.1) and (1990, 68.5).

a. Find the annual rate of change of the model whose graph is the line connecting these points.

b. What does this tell us about men in the workforce?

56. **Marginal Cost** Suppose the monthly total cost for the manufacture of 19-inch television sets is $C(x) = 2546 + 98x$, where $x$ is the number of TVs produced each month.

a. What is the slope of the graph of the total cost function?

b. What is the marginal cost for the product?

c. Interpret the marginal cost for this product.