

42. **RECREATION** You have \$30 to spend at a carnival. It costs \$2.50 to take one ride and \$1.50 to play one game. Write and graph an inequality that represents the possible numbers of rides you can take and games you can play. Then list all ordered pairs (rides, games) that use all \$30. (p. 132)
43. **BASKETBALL** The price of admission to a high school basketball game is \$5 for adults and \$2 for students. At a game that had a total attendance of 650 people, the total income from ticket sales was \$2500. Write and solve a linear system to find the numbers of adults and students who attended the basketball game. (p. 160)
44. **BUSINESS** Two telephone companies compete for customers in a town. Initially, each company has 700 customers. Every month, 5% of company A's customers switch to company B, and 2% of company B's customers switch to company A. The transition matrix  $T$  and population matrix  $M_0$  model this situation.
- $$T = \begin{bmatrix} 0.95 & 0.02 \\ 0.05 & 0.98 \end{bmatrix} \quad M_0 = \begin{bmatrix} 700 \\ 700 \end{bmatrix}$$
- Find  $M_1 = TM_0$ ,  $M_2 = TM_1$ , and  $M_3 = TM_2$ . Explain what these matrices represent. Describe what happens to the distribution of customers over time if this pattern continues. (p. 195)
45. **MAPS** A county map uses a coordinate grid for which one unit represents a quarter of a mile. A lake on the map has an approximately triangular shape with vertices near (2, 2), (12, 19), and (18, 7). Estimate the area of the surface of the lake. (p. 203)
46. **TENNIS** While serving, a tennis player strikes the ball at a height of 9 feet above the court. The initial downward velocity of the ball is 16 feet per second. How long does it take the ball to strike the court on the opponent's side? (Hint: Use the function  $h = -16t^2 + v_0t + h_0$ .) (p. 292)
47. **DISCOUNTS** A store is having a sale in which you can take \$50 off the cost of any television in the store. The store also offers 15% off your purchase if you open a charge account. Use composition of functions to write a new function that gives the sale price of a television that originally costs  $t$  dollars if \$50 is subtracted before the 15% discount is applied. Then find the sale price of a television that originally cost \$480. (p. 428)
48. **ACCOUNT BALANCE** You deposit \$4500 in a savings account that pays 2.75% annual interest compounded monthly. Find the account balance after 5 years. (p. 478)
49. **STAMPS** The table shows the cumulative number  $s$  of different designs of stamps produced in the United States during the period 1904–2004. The variable  $t$  represents the number of years since 1904. Find an exponential model for the data. (p. 529)

$t$	0	10	20	30	40	50	60	70	80	90	100
$s$	313	459	616	751	926	1063	1260	1552	2109	2887	3894