

51. The volume of a pyramid with a square base is given by  $\frac{1}{3}s^2h$ , where  $s$  is the side of the base and  $h$  is the height. Find the volume of the Great Pyramid of Cheops in Egypt if its height is 250 yards and the side of its base is 160 yards.
52. The harmonic mean of two numbers is given by twice their product divided by their sum.
- Choose variables and write an algebraic expression for the harmonic mean.
  - Find the harmonic mean of 6 and 12.
53.
  - Write an algebraic expression for the surface area of a rectangular tank whose length is 4 feet greater than its width.
  - Write an algebraic expression for the cost of the tank if the bottom and sides of the tank cost \$2 per square foot and the top costs \$0.80 per square foot.
  - How much will the tank described above cost if it is 8 feet wide and 4 feet tall?
54. Senator Fogbank sells silk-screened T-shirts to support his campaign. It costs  $2x + 700$  dollars to produce  $x$  T-shirts, and their sale will bring in  $8x - 0.01x^2$  dollars.
- Write an expression for the profit expected from the sale of  $x$  T-shirts.
  - What profit will be earned from the sale of 1000 T-shirts?
55. An ice cream vendor sells  $200 - 2x$  Fudgesicles per day if he charges  $x$  cents per Fudgesicle.
- Write an expression for the vendor's income from the sale of Fudgesicles when he charges  $x$  cents.
  - Make a table showing his income at different selling prices  $x$  for 10-cent increments in  $x$ .
56. In the spring the Neighborhood Nursery takes in  $400x - 80x^2$  dollars per week from the sale of blue iris bulbs. Use factoring to write an expression for the number of bulbs sold per week at a price of  $x$  dollars per bulb.
57. An airline offers a charter flight to Hawaii for \$500 per person if 25 people sign up. For each additional person who signs up, the fare is reduced by \$5 per person.
- Write a polynomial for the airline's total income from the flight if  $x$  additional people sign up.
  - If 37 people sign up, what is the airline's income from the flight?
58. If the interest on an account is computed every 6 months and added to the principal, the interest is said to be compounded semiannually. At the end of  $n$  years the amount of money in the account is given by

$$P\left(1 + \frac{r}{2}\right)^{2n},$$

where  $P$  is the original principal and  $r$  is the interest rate.

- Write polynomials for the amount of money in the account after 1 year and the amount after 18 months.
- If \$500 is invested at 6% interest, find the amount after 1 year and the amount after 18 months.