

## Applications with Quadratic Equations

- 1) The area of a rectangle is 51 squared feet. The length is 14 more than the width. Find the perimeter of the rectangle.
- 2) Find three consecutive positive integers such that the product of the first two is 22 less than 11 times the third.
- 3) A square is altered so that one dimension is increased by 4, while the other dimension is decreased by 2. The area of the resulting rectangle is 55. Find the area of the original square.
- 4) A picture inside a frame is 2 inches longer than it is wide. The picture is in a frame that has a width of 3 inches on each side of the picture. If the area of the picture including the frame is 195 squared inches, find the dimensions of the frame.
- 5) If a gym charges its members \$300 per year to join, they get 1000 members. For each \$2 increase in price they can expect to lose 5 members. How much should the gym charge to maximize its revenue? What is the gym's maximum revenue?
- 6) A tour bus in the historic district of Savannah, Georgia, serves 300 customers a day. The charge is \$8 per person. The owner estimates that the company would lose 20 passengers a day for each \$1 fare increase.
  - a. What charge would give the most income for the money?
  - b. If the company raised their fare to this price, how much daily income should they expect to bring in?
- 7) A rectangular photograph is 8 centimeters wide and 12 centimeters long. The photograph is enlarged by increasing the length and the width by an equal amount in order to double its area. What are the dimensions of the new photograph?
- 8) A quilt is 3 feet by 6 feet. If there is 22 ft<sup>2</sup> of fabric available to use as a border around the quilt, how wide should the border be? Assume all of the fabric is used.
- 9) A rectangular piece of metal is 30 in longer than it is wide. Squares with sides 6 in long are cut from the four corners and the flaps are folded upward to form an open box. If the volume of the box is 3354 in<sup>3</sup>, what were the original dimensions of the piece of metal?
- 10) One base of a trapezoid is 4 in. more than twice the length of the second base. The height of the trapezoid is 3 in. If the area of the trapezoid is 72 in<sup>2</sup>, find the bases of the trapezoid.  
(Note: The area of a trapezoid is  $A = \frac{1}{2}(b_1 + b_2)h$ .)