Section 5.7
Exercises

For each problem, define a variable, write a quadratic function, and then use the function to answer the question.

1. The sum of two numbers is 40 and their product is 391. Find the two numbers.

2. The sum of two numbers is 26 and their product is 168. Find the two numbers.

3. The perimeter of a rectangle is 54 inches and its area is 162 square inches. Find the dimensions of the rectangle.

4. The perimeter of a rectangle is 98 cm and its area is 600 square cm. Find the dimensions of the rectangle.

5. The length of a rectangle is 4 inches more than its width. If the area of the rectangle is 96 square inches, find the dimensions. Then find the perimeter of the rectangle.

6. The width of a rectangle is 6 cm less than its length. If the area of the rectangle is 135 square cm, find the dimensions. Then find the perimeter of the rectangle.

7. An open top box is made by cutting 4 inch squares from each corner of a square piece of sheet metal and then folding up the flaps. The volume of the box is to be 2304 square inches. Find the dimensions of the original piece of sheet metal.

8. An open top box is made by cutting 5 inch squares from each corner of a square piece of sheet metal and then folding up the flaps. The volume of the box is to be 980 square inches. Find the dimensions of the original piece of sheet metal.

9. A homeowner wants to install a deck around her swimming pool. The swimming pool is a rectangle and measures 26 feet by 36 feet. The deck is to have the same width all the way around the pool. What should be the width of the deck if they have 888 square feet of decking material?

10. A homeowner wants to install a deck around her swimming pool. The swimming pool is a rectangle and measures 45 feet by 55 feet. The deck is to have the same width all the way around the pool. What should be the width of the deck if they have 1100 square feet of decking material?

Use the function that is stated in the problem to answer the question.

11. A company models its annual profits using the function $P(x) = x^2 + 80x - 500$, where P represents profits and x gives the number of units sold. One year, their profits were \$296,016. How many units of their product did they sell?

12. A company models its annual profits using the function $P(x) = x^2 + 20x - 10000$, where P represents profits and x gives the number of units sold. One year, their profits were \$89756. How many units of their product did they sell?