General Algebra II Worksheet #8 Unit 8 Selected Solutions

Write a second degree equation in one variable to solve each of the following problems. Express irrational solutions rounded to the nearest tenth.

3. One number is 2 less than 5 times another. Their product is 50. What are the numbers?

first: x
second: $5x - 2$

$$x(5x - 2) = 50$$
$$5x^2 - 2x = 50$$
$$5x^2 - 2x - 50 = 0$$
$$x = \frac{2 \pm \sqrt{1004}}{10}$$
$$x \approx 3.4 \quad \text{or} \quad x \approx -3.0$$
$$5x - 2 \approx 14.8 \qquad 5x - 2 \approx -16.8$$

The numbers are about 3.4 and 14.8 or -3.0 and -16.8

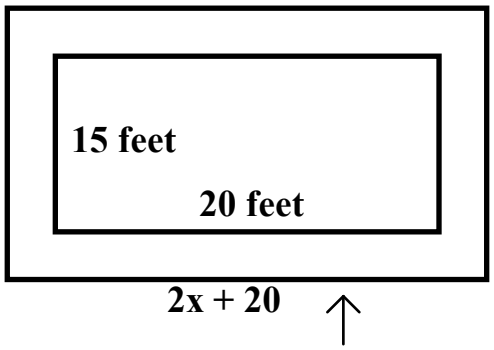
6. The area of a rectangle is 15 square inches. Find its dimensions if its length is 1 inch more than twice its width.

Width: x inches
Length: $2x + 1$

$$x(2x + 1) = 15$$
$$2x^2 + x = 15$$
$$2x^2 + x - 15 = 0$$
$$(2x - 5)(x + 3) = 0$$
$$x = 5/2 \quad \text{or} \quad x = -3$$
$$2x + 1 = 6$$

The rectangle is 6 inches long and 2.5 inches wide.

9. A rectangular garden that is 20 feet long and 15 feet wide is surrounded by a path of uniform width. Find the width of the path if its area is 200 square feet.



Let x represent the width of the path.

$$(2x + 20)(2x + 15) = 500$$
$$4x^2 + 70x + 300 = 500$$
$$4x^2 + 70x - 200 = 0$$
$$2x^2 + 35x - 100 = 0$$
$$(2x - 5)(x + 20) = 0$$
$$x = 2.5 \quad \text{or} \quad x = -20$$

The area of the large rectangle is equal to the area of the garden plus the area of the path = 300 + 200 = 500 square feet.

The path is 2.5 feet wide.