

General Algebra II Worksheet #9 Unit 8 Selected Solutions

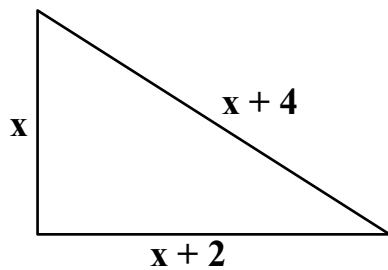
Write a second degree equation in one variable to solve each of the following problems. Express irrational solutions rounded to the nearest tenth.

3. The sum of a number and its square is 8. What is the number?

$$\begin{aligned} \text{Let } x \text{ represent the number. } \quad x + x^2 &= 8 \\ x^2 + x &= 8 \\ x^2 + x - 8 &= 0 \\ x &= \frac{-1 \pm \sqrt{33}}{2} \\ x &\approx 2.4 \quad \text{or} \quad x \approx -3.4 \end{aligned}$$

The number is about 2.4 or about -3.4.

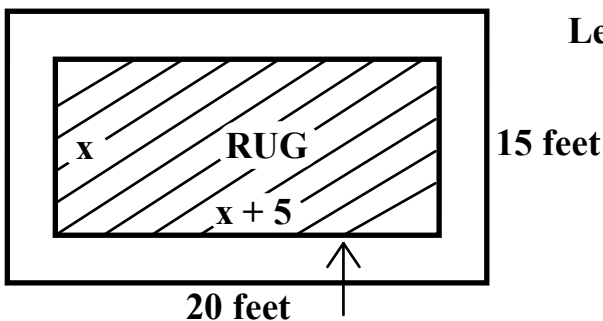
7. The length of one leg of a right triangle is 2 inches more than the length of the other leg. The length of the hypotenuse is 4 inches more than the length of the shorter leg. How long is each side of the triangle.



$$\begin{aligned} x^2 + (x + 2)^2 &= (x + 4)^2 \\ x^2 + x^2 + 4x + 4 &= x^2 + 8x + 16 \\ x^2 - 4x - 12 &= 0 \\ (x - 6)(x + 2) &= 0 \\ x &= 6 \quad \text{or} \quad x = -2 \\ x + 2 &= 8 \\ x + 4 &= 10 \end{aligned}$$

The lengths are 6 inches, 8 inches, and 10 inches.

9. Find the dimensions of a rug that covers 68% of the floor of a room that is 20 feet long and 15 feet wide if the edges of the rug are equidistant from the walls.



Let x represent the width of the rug..

$$\begin{aligned} x(x + 5) &= 204 \\ x^2 + 5x &= 204 \\ x^2 + 5x - 204 &= 0 \\ (x - 12)(x + 17) &= 0 \\ x &= 12 \quad \text{or} \quad x = -17 \\ x + 5 &= 17 \end{aligned}$$

The area of the rug, the smaller rectangle, is 68 percent of the area of the room which is $(.68)(300) = 204$ square feet.

The rug is 17 feet long and 12 feet wide.