

Quadratic Word Problems

1. The length of a rectangle is 2 *cm* less than its width. If the area of the rectangle is 35 *cm*², find the width.

2. The ratio of length to width (measured in inches) in a rectangle is 4:7. Find the length of the rectangle if the area is known to be 700 *in*².

3. Find two consecutive odd integers whose product is 99. (Note: There are two different pairs of consecutive odd integers.)

Quadratic Word Problems

1. The length of a rectangle is 2 cm less than its width. If the area of the rectangle is 35 cm^2 , find the width.

$$\begin{aligned}(w - 2)(w) &= 35 \\ w^2 - 2w - 35 &= 0 \\ (w + 5)(w - 7) &= 0 \\ w &= 7 \text{ or } -5\end{aligned}$$

However, since the measurement can only be positive, the width is 7 cm.

2. The ratio of length to width (measured in inches) in a rectangle is 4:7. Find the length of the rectangle if the area is known to be 700 in^2 .

$$\begin{aligned}(4x)(7x) &= 700 \\ 28x^2 - 700 &= 0 \\ 28(x^2 - 25) &= 0 \\ 28(x + 5)(x - 5) &= 0 \\ x &= 5 \text{ or } -5\end{aligned}$$

However, the measure can only be positive, which means $x = 5$, and the length is 20 inches.

3. Find two consecutive odd integers whose product is 99. (Note: There are two different pairs of consecutive odd integers.)

Let n represent the first odd integer and $n + 2$ represent the subsequent odd integer. The product is $n(n + 2)$, which must equal 99.

$$\begin{aligned}n(n + 2) &= 99 \\ n^2 + 2n - 99 &= 0 \\ (n - 9)(n + 11) &= 0 \\ n &= 9 \text{ or } n = -11\end{aligned}$$

The two consecutive pairs of integers would be

$$2(5) - 1 = 9; 2(5) + 1 = 11$$

AND

$$2(-5) - 1 = -11; 2(-5) + 1 = -9$$

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