

## Conditions

The side of a square equals the length of a rectangle. The width of the rectangle is 4 meters longer than its length. The sum of the areas of the square and the rectangle is 48 square centimeters. Find the side of the square!

## Solution

Let the side of rectangle is  $x$ . Then the width is  $4+x$ .

The area of rectangle will be:

$$x(x + 4)$$

The area of the square is:

$$x^2$$

Then,

$$x(x + 4) + x^2 = 48$$

This is a quadratic equation. Let's solve this using the discriminant formula:

$$2x^2 + 4x - 48 = 0$$

Divide by 2:

$$x^2 + 2x - 24 = 0$$

$$D = b^2 - 4ac = 4 + 4 \cdot 24 = 4 + 96 = 100$$

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a} = \frac{-2 \pm 10}{2} = \begin{cases} x_1 = 4 \\ x_2 = -6 \end{cases}$$

$x_2 = -6$  is not a possible value, as the length can't be negative value.

Then, the length of the rectangle is 4. And it's equal to side of the square.

**Answer: 4**