Solving an Area Problem

Abe Biggs wants to plant a flower bed in a triangular area in a corner of his garden. One leg of the right-triangular flower bed will be 2 m shorter than the other leg, and he wants the bed to have an area of 24 m². See Figure 1. Find the lengths of the legs.

Step 1 **Read** the problem carefully. We need to find the lengths of the legs of a right triangle with area 24 m².

$x - 2$

x

FIGURE 1

Step 2 **Assign a variable.**

Let $x =$ the length of one leg.

Then $x - 2 =$ the length of the other leg.

Step 3 **Write an equation.** The area of a right triangle is given by the formula

$$\text{area} = \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2}bh.$$

In a right triangle, the legs are the base and height, so we substitute 24 for the area, x for the base, and $x - 2$ for the height in the formula.
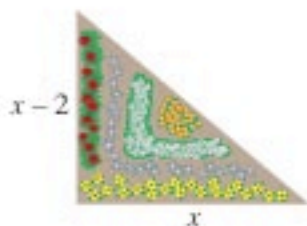
Step 4 **Solve.**

Step 5 **State the answer.**

Step 6 **Check.**