The Pythagorean theorem states that in a right triangle, the square of the hypotenuse (c) is equal to the sum of the squares of the other two sides (a and b):

$$\mathbf{c^2 = a^2 + b^2}$$

Given:

- a = 36 inches
- b = 27 inches

Step 1: Square both legs:

$36^2 = 36 \times 36 = 1296$

$27^2 = 27 \times 27 = 729$

Step 2: Add the squares together:

$1296 + 729 = 2025$

Step 3: Take the square root of the sum to find the hypotenuse c:

$c = \sqrt{2025} = 45$ inches

Answer: The length of the hypotenuse c is 45 inches.