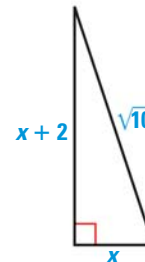**EXAMPLE 2**   Use the Pythagorean theorem

A right triangle has one leg that is 2 inches longer than the other leg. The length of the hypotenuse is $\sqrt{10}$ inches. Find the unknown lengths.

Solution

Sketch a right triangle and label the sides with their lengths. Let x be the length of the shorter leg.

$a^2 + b^2 = c^2$	**Pythagorean theorem**
$x^2 + (x + 2)^2 = (\sqrt{10})^2$	**Substitute.**
$x^2 + x^2 + 4x + 4 = 10$	**Simplify.**
$2x^2 + 4x - 6 = 0$	**Write in standard form.**
$2(x - 1)(x + 3) = 0$	**Factor.**
$x - 1 = 0 \ or \ x + 3 = 0$	**Zero-product property**
$x = 1 \ or \quad x = -3$	**Solve for x.**

▶ Because length is nonnegative, the solution $x = -3$ does not make sense. The legs have lengths of 1 inch and $1 + 2 = 3$ inches.

TAKS

EXAMPLE 3   **TAKS PRACTICE: Multiple Choice**

A soccer player makes a corner kick to another player, as shown. To the nearest yard, how far does the player kick the ball?

ELIMINATE CHOICES
The hypotenuse is the longest side of the triangle, so the length must be greater than 52 yards. Eliminate choices A and B.

(A) 7 yards   (B) 50 yards

(C) 54 yards   (D) 66 yards

Solution

The path of the kicked ball is the hypotenuse of a right triangle. The length of one leg is 14 yards, and the length of the other leg is 52 yards.

$c^2 = a^2 + b^2$	**Pythagorean theorem**
$c^2 = 14^2 + 52^2$	**Substitute 14 for a and 52 for b.**
$c^2 = 2900$	**Simplify.**
$c = \sqrt{2900} \approx 54$	**Take positive square root of each side.**

▶ The correct answer is C. (A) (B) (C) (D)

✓ **GUIDED PRACTICE**   for Examples 2 and 3

2. A right triangle has one leg that is 3 inches longer than the other leg. The length of the hypotenuse is 15 inches. Find the unknown lengths.

3. SWIMMING A rectangular pool is 30 feet wide and 60 feet long. You swim diagonally across the pool. To the nearest foot, how far do you swim?