

The Pythagorean Theorem: Applications

Example 1. An eight-foot ladder is placed against a wall so that the base of the ladder is 2 ft away from the wall. What is the height of the top of the ladder?

Since the ladder, the wall, and the ground form a right triangle, this problem is easily solved by using the Pythagorean Theorem. Let h be the unknown height. From the Pythagorean Theorem, we get:

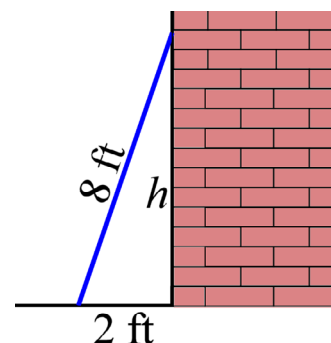
$$2^2 + h^2 = 8^2$$

$$4 + h^2 = 64$$

$$h^2 = 60$$

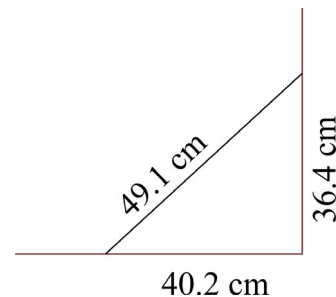
$$h = \sqrt{60}$$

$$h \approx 7.75$$



Our answer, 7.75, is in feet. This means the ladder reaches to about $7 \frac{3}{4}$ ft = 7 ft 9 in. high.

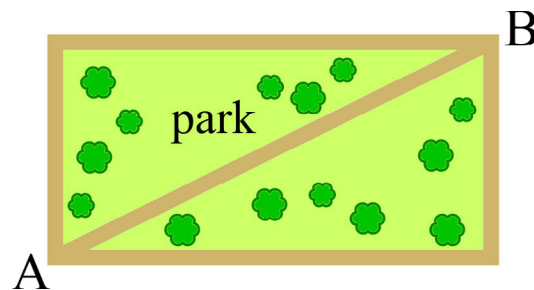
1. Is this corner a right angle?



2. How long is the diagonal of a laptop screen that is 9.0 inches high and 14.4 inches wide?

Note: when a laptop is advertised as having a “15-inch screen,” it is the diagonal that is 15 inches, not the width or the height.

3. A park is in the shape of a rectangle and measures 48 m by 30 m. How much longer is it to walk from A to B around the park than to walk through the park along the diagonal path?



4. The area of a square is 100 m^2 . How long is the diagonal of the square?