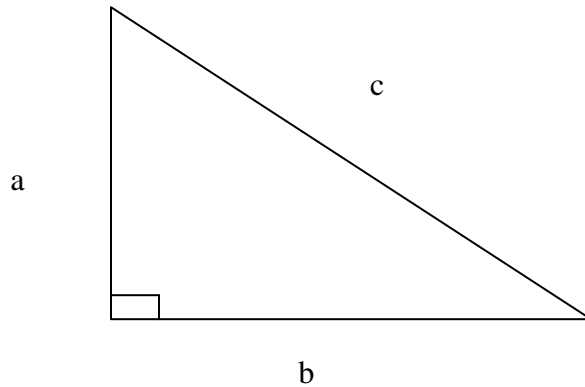


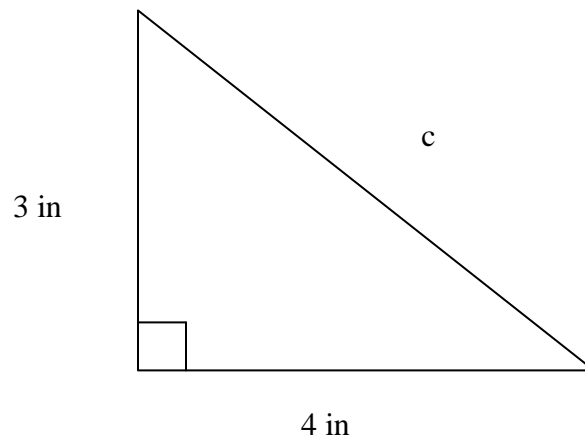
Pythagorean Theorem: The Pythagorean Theorem is a formula that is used to figure out the lengths of the sides in a **right triangle**. The formula does not work on acute or obtuse triangles. The Pythagorean Theorem is:

$$a^2 + b^2 = c^2$$

Here is an example:



How to use the Pythagorean Theorem:

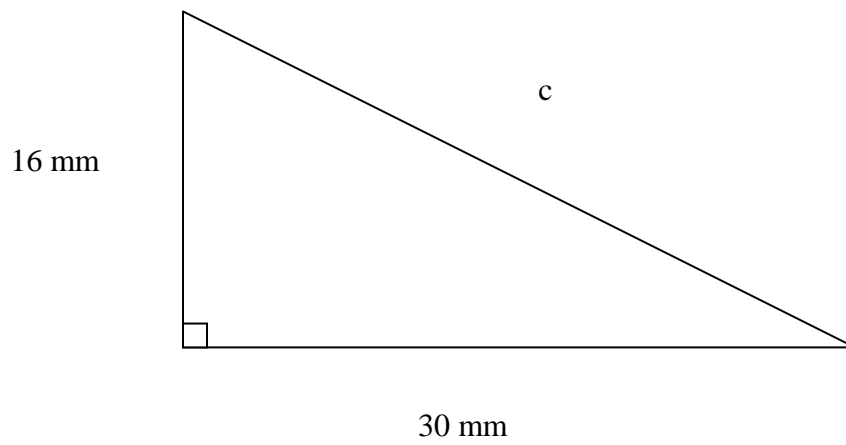
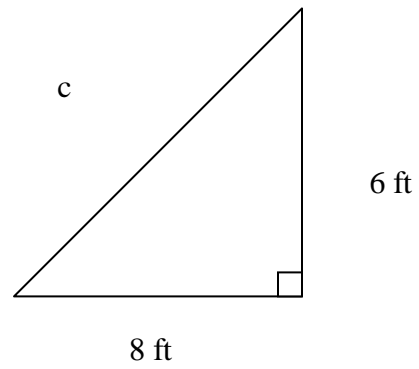
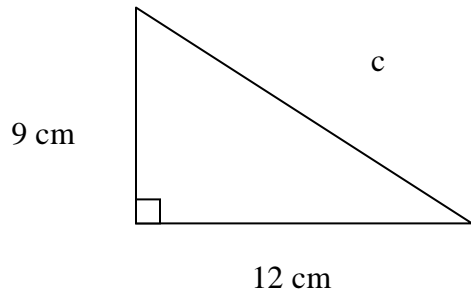


For this triangle, you would use the Pythagorean Theorem to find c.

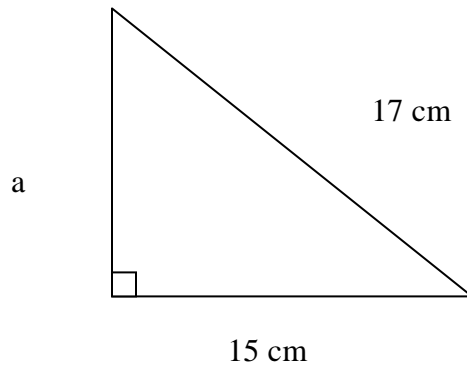
$$\begin{array}{r} 3^2 + 4^2 = c^2 \\ \downarrow \quad \downarrow \\ 9 + 16 = c^2 \\ 25 = c^2 \end{array}$$

Since 5^2 equals 25, the length of c is 5 inches.

TASK #1: Using the Pythagorean Theorem, find the length of c in the following triangles: (*SHOW YOUR WORK!*)



Solving for a or b: There are times when you will need to solve for either a or b. The Pythagorean Theorem will still work. For example:



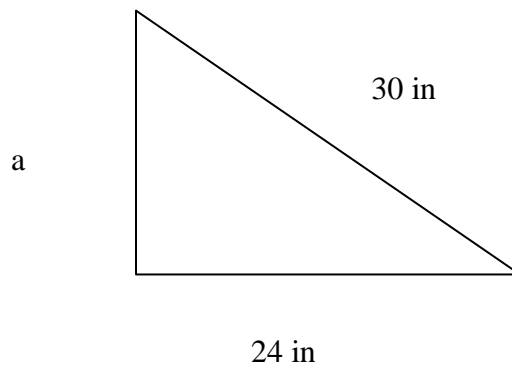
For this right triangle, you will need to solve for a. Set up the Pythagorean Theorem with the values that you know.

$$a^2 + 15^2 = 17^2$$
$$a^2 + 225 = 289 \quad (\text{subtract } 225 \text{ from both sides})$$

$$a^2 = 64$$

The length of a is 8 cm.

TASK #2: Using the Pythagorean Theorem, solve for the missing side. (**SHOW ALL WORK!**)



TASK #3: You will be going to the small gym to figure out exactly how far it is from the rim on a basketball hoop to the free throw line. The distance from the floor to the rim is 10 feet (a). Utilizing a measuring tape, you will need to measure the distance (in ft) from the free throw line to the spot on the gym floor directly under the front of the rim (b). Use the Pythagorean Theorem to find the length of the imaginary line that starts at the front of the rim and goes to the free-throw line (c).

Once you have your dimensions, please draw and label a diagram in the space provided.