

Pythagorean Theorem

A **right triangle** is one that has a 90-degree angle in it.

- We show that an angle is exactly 90 degrees with a square (see below)

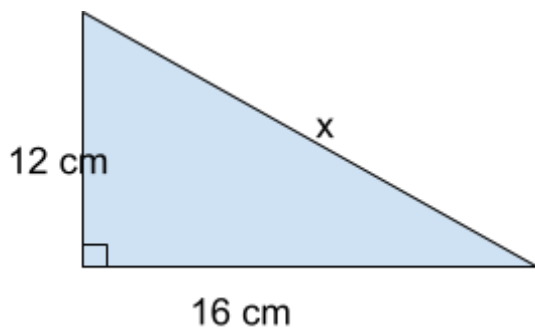
The **Pythagorean Theorem** says that the **hypotenuse** (longest side) of a right triangle is related to the other two side lengths by this formula: $a^2 + b^2 = c^2$

If you are solving for the *longest* side: $c = \sqrt{a^2 + b^2}$

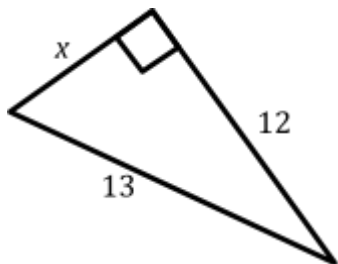
If you are solving for either of the short sides: $a^2 = c^2 - b^2$ (we are isolating a)
 $a = \sqrt{c^2 - b^2}$

Examples

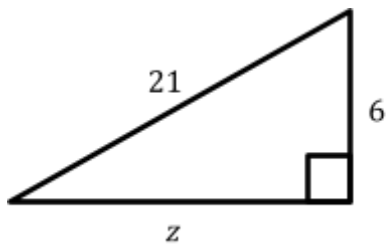
7. Calculate the length of the **hypotenuse** of this right triangle. It will be an exact number.



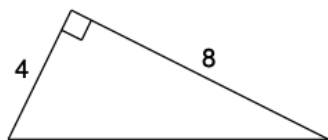
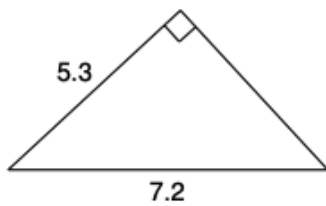
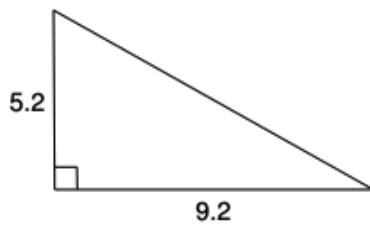
8. Calculate the length of this *short side* of a right triangle. It will be an exact number.



9. Calculate the length of this *short side* of a right triangle.
Round your answer to TWO decimal places.

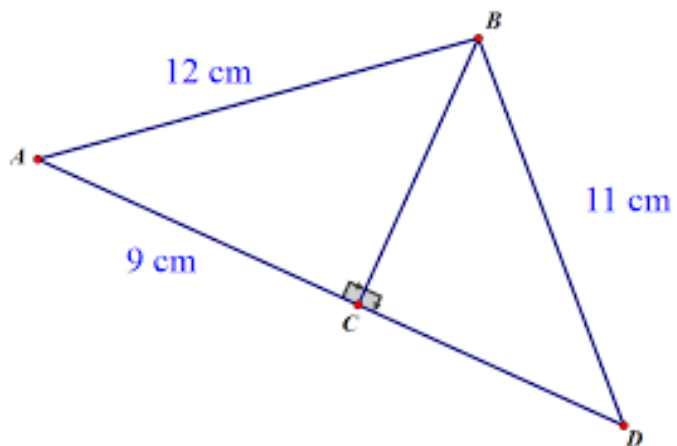


10. Solve for the unknown side length in each triangle.
Round your answer to two decimal places, if necessary.
There are no units

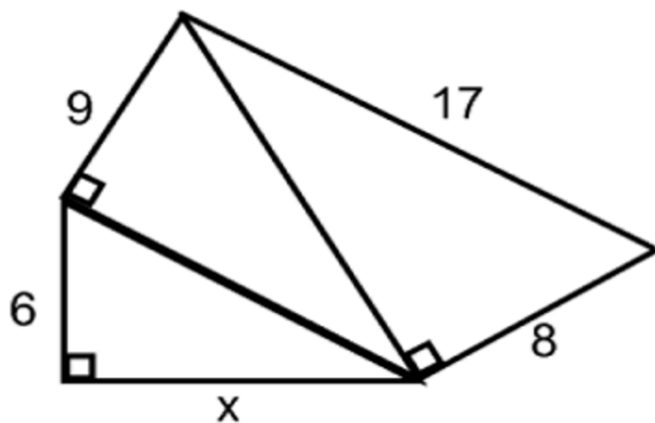


Pythagorean Theorem with Multiple Triangles

11. Solve for the length of CD (distance from C to D) in this triangle. You will have to use the Pythagorean Theorem to find the distance from B to C, And then use it *again* to find CD.

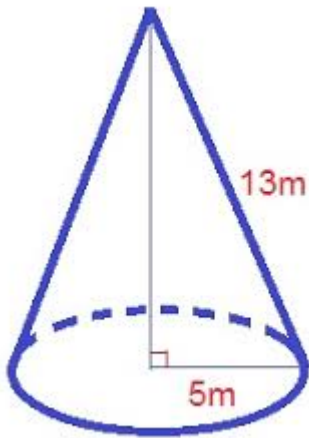


12. Solve for the length x here - it will require using Pythagorean Theorem three times.



This is a **three-dimensional** shape (it could be filled with water, it would take up space in the real world). Specifically, it is a **cone** (one end is a circle, and it goes to the point at the other end)

13. The circle at the bottom has a radius of 5 m (shown).
The **slant height** is 13m.
What is the height of the cone?



14. The diagonal of this **triangular prism** is x (shown).
Calculate the length of x (two decimal places)

