The Pythagorean Theorem is a special rule we use in mathematics for right triangles. A right triangle is a type of triangle that has one angle that is exactly 90 degrees (like a corner of a square). The Pythagorean Theorem states that if you have a right triangle, the square of the length of the longest side (called the hypotenuse) is equal to the sum of the squares of the lengths of the other two sides. The formula looks like this:

aÂ² + bÂ² = cÂ²

Here, **a** and **b** are the lengths of the two shorter sides (legs) of the triangle, and **c** is the length of the hypotenuse.

When to Simplify a Question

You simplify a question when you have extra information that makes the problem easier to solve. For example, if the problem gives you the lengths of one side and the hypotenuse, you can simplify the problem because you only need to find the other side using the Pythagorean Theorem. This involves breaking down the problem step by step:

- Use the Pythagorean Theorem formula.
- Plug in the values you know.
- Perform the calculations needed to find the unknown value.

When to Subtract

You specifically subtract when you're trying to find a side length, and you already have the measurements for another side and the hypotenuse. For instance:

1. Say you know the hypotenuse (c) and one leg (a).
2. Use the rearranged formula: **bÂ² = cÂ² - aÂ²**.
3. Then subtract the square of side a from the square of side c to find b.

When to Add

You specifically add values when calculating the total area or using the Pythagorean Theorem directly. If you have to find the hypotenuse and the two sides are given:

1. Square each of the two legs (the lengths of sides a and b).
2. Add the squared values together: **aÂ² + bÂ²**.
3. The result is the square of the hypotenuse. Finally, take the square root to find the length of c.

In summary:

- Simplify the question to make calculations easier whenever possible.
- Subtract when you have the hypotenuse and one side and want to find the other side.
- Add when you need to combine the squares of two sides to find the hypotenuse.

By following these steps, you'll be able to solve problems involving right triangles and the Pythagorean Theorem with confidence!