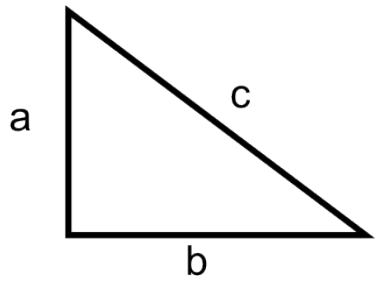
1. **State and prove the Pythagorean Theorem.**

   Pythagorean Theorem: Given a right angle of side lengths a,b and c, with c being the hypotenuse, we have:

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

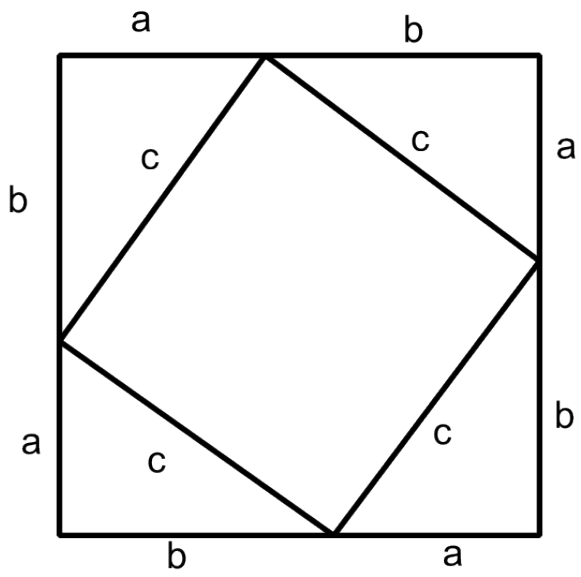
   To prove the theorem, we start by drawing a picture of triangle of sides a, b and c, with c being the hypotenuse.

   Comments: We should always start by stating what we know, what the variables means

   Comments: Always draw a picture and label it. A picture is almost worth a 1000 words.

   We can then join four copies of these triangles together to form a square like so:



Comments: Writing math is almost like providing a running commentary of what you're doing.

If we calculate the area of the square, we get that:

$$\text{Area} = (a+b)^2. \tag{1}$$

We can also calculate the area of the square by calculating the area of each component. To do that, we have to justify why the middle shape is a square. Firstly, all four side lengths are the same since they all have length c. Now we have to reason that the angles are all 90 degrees. We know that the angles inside a triangle adds up to 180°. Therefore, the angle between sides a and c, and well as the angle between b and c must add up to 90° (since the third angle in the triangle is a right angle). That means the angle between the two sides of c must be 90° and hence the middle shape must be a square. So that means the Area of the big square is also equal to:

Comments: Step through your reasoning step by step, include every detail.

$$\text{Area} = 4\left(\frac{ab}{2}\right) + c^2. \tag{2}$$

Equating the two expression for Area, we have:

$$\begin{aligned}(a+b)^2 &= 4\left(\frac{ab}{2}\right) + c^2 \\ a^2 + 2ab + b^2 &= 2ab + c^2 \\ a^2 + b^2 &= c^2.\end{aligned}$$

Thus we have shown that for a right angle triangle of side lengths a, b and c, with c being the hypotenuse, we have the relation $a^2 + b^2 = c^2$.

Comments: Always have a concluding remark to sum up what you have done.

2. **Question 2 goes here.**

3. **Question 3 goes here.**