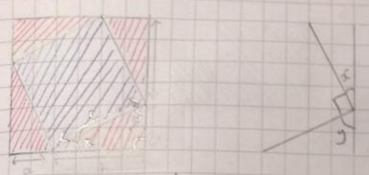
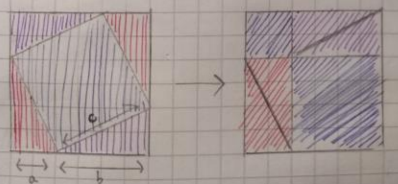
Method 1



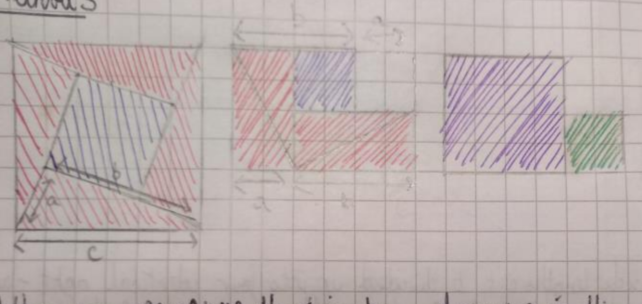
Take a square with side lengths $a + b$, divided up into four identical right-angled triangles and an enclosed quadrilateral of sides c. Along each side of the large square there is a point where the angle of the enclosed quadrilateral, an angle x and an angle y meet. The angles of the triangles x and y add to $90°$. These three angles add up to $180°$, therefore each angle of the enclosed quadrilateral is a right angle. Therefore the enclosed quadrilateral is a square. The area of the large square = $(a + b)^2 = a^2 + 2ab + b^2$. The area of the four right-angled triangles = $4 \times \frac{1}{2}ab$ = $2ab$. The area of the enclosed square = area of large square - area of four triangles. Area of enclosed square = area of large square - area of four triangles. Area of enclosed square = $a^2 + 2ab + b^2 - 2ab = a^2 + b^2$. The area of the enclosed square is also given by c^2, therefore $a^2 + b^2 = c^2$. Therefore, in any right-angled triangle, the area of the square on the hypotenuse equals the sum of the areas of the squares on the other two sides.

Method 2



When ~~your~~ you put the two triangles together to create a rectangle, finding the area becomes easier. In the original square, the area of the big square is $a^2 + 2ab +$ b^2. This is the same for the new square, and if you ignore the triangles, there will be the enclosed square in the original square. The smaller square is equal to a^2, as we can see that the length of the square is equal to the height of the purple triangle or the base of the red triangles. The bigger square is equal to b^2, which is the height of the red triangles or the base of the purple triangle. The area of the enclosed square in the first square is c^2. This means that c (the hypotenuse) squared will always result in being $a^2 + b^2$ in right-angled triangles.

Method 3



When you rearrange the triangles and square in this way, you can see that the length of the blue square is equal to a. This is because when you subtract the top length of the whole shape to the bottom of the whole shape, you get $a + b - b$ which is a. a is the length missing on the top. Once you know this, you can figure out that the length of the blue square is a. The larger square on the third diagram has sides with a length of b, as the top length is the same as the line marked 'b' on the first diagram. The second square has a height of a, like the height of the red triangles. By finding the area of the large square in diagram 1, and the area of the purple and green squares, we can figure out that $a^2 + b^2 = c^2$.