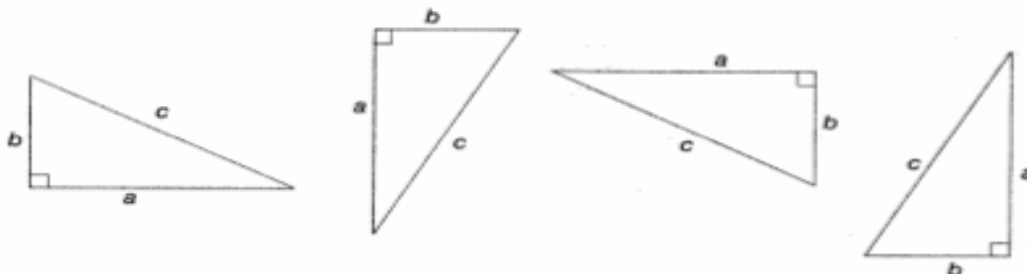
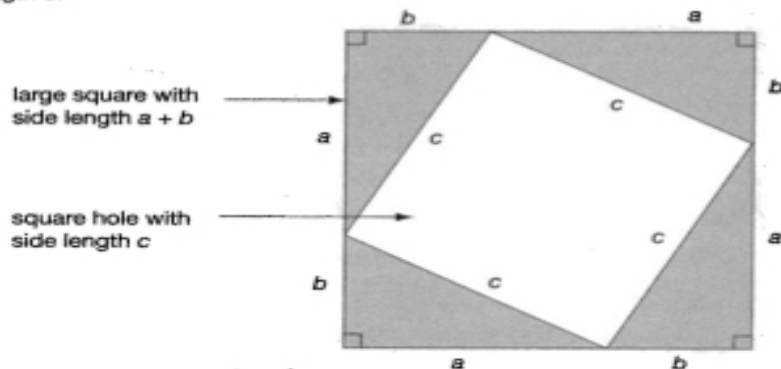


**Activity:**

**Step 1:** Cut out four copies of the same right triangle. Identify the leg lengths as  $a$  and  $b$  and the hypotenuse length as  $c$ .



**Step 2:** Position the triangles to form a square with side length  $a + b$  and an inside hole with side length  $c$ .



**Step 3:** Reason as follows:

- Each of the four triangles has an area of  $\frac{ab}{2}$ .
- The hole is a square, since the angles have to be right angles because the other two angles are the acute angles in a right triangle and add to 90 degrees. The area of the square hole is  $c^2$ .
- The area of the large square with side length  $a + b$  is  $(a + b)^2$ , and its area is the sum of the areas of the hole and the four triangles.

$$\text{So } (a + b)^2 = c^2 + 4 \cdot \frac{ab}{2}.$$

*(Continued on next page)*

**Fig. 3.14.** Linking a geometric representation with an algebraic representation to validate the Pythagorean theorem