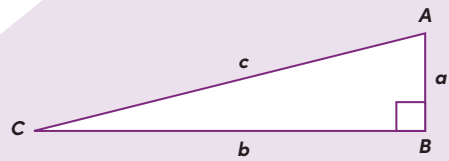
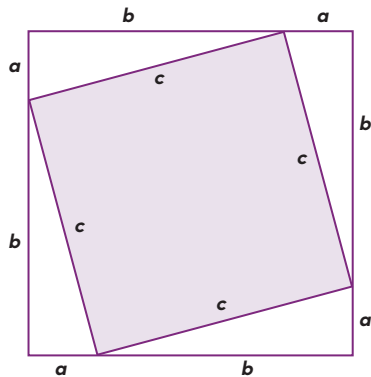


## PROVING THE PYTHAGOREAN THEOREM

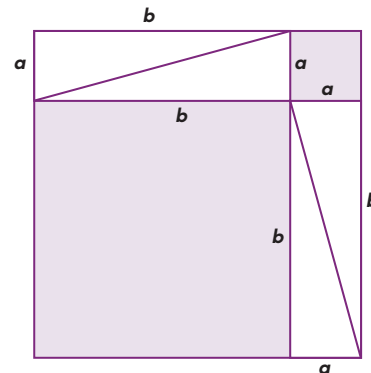
Triangle  $ABC$  is a right triangle with side lengths  $a$ ,  $b$ , and  $c$ .  
Follow the directions below to prove that  $a^2 + b^2 = c^2$ .



Each large square below is made up of 4 copies of triangle  $ABC$  and one or two squares. The large squares are congruent because they both have side lengths of  $a + b$ , and the triangles in each large square are congruent. Answer each question below to write the area of the large square in two different ways.



- 1** What is the area of the square with side lengths of  $c$ ? Write your answer using an exponent.
- 2** What is the area of each triangle?
- 3** Write the area of this large square by adding the areas of all the shapes inside the square. Simplify your answer.



- 1** What is the area of the square with side lengths of  $a$ ? Write your answer using an exponent.
- 2** What is the area of the square with side lengths of  $b$ ? Write your answer using an exponent.
- 3** What is the area of each rectangle formed by two triangles?
- 4** Write the area of this large square by adding the areas of all the shapes inside the square. Simplify your answer.

Since the large squares are congruent, set their areas equal to each other. Then solve for  $c^2$ .

★ You've used given information and your prior knowledge to form a mathematical argument that shows that if triangle  $ABC$  is a right triangle, then  $a^2 + b^2 = c^2$ . So, you've written a proof of the Pythagorean theorem!