

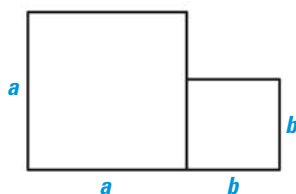
# 11 TAKS PREPARATION



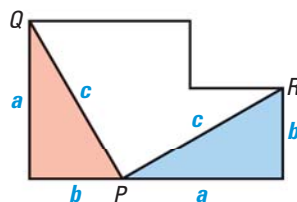
TAKS Obj. 7  
TEKS 8.7.C

## REVIEWING PROBLEMS INVOLVING THE PYTHAGOREAN THEOREM

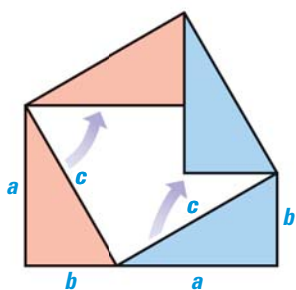
The Pythagorean theorem expresses a relationship among the lengths of the sides of a right triangle. It also expresses a relationship among the areas of squares built on the sides of a right triangle. Consider the demonstration below.



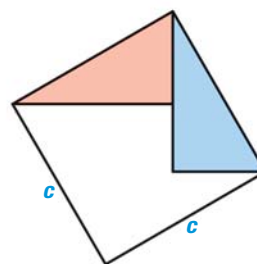
**STEP 1** Place squares with areas  $a^2$  square units and  $b^2$  square units next to each other, as shown.



**STEP 2** Locate point  $P$  so that it is  $b$  units to the right of the lower left corner of the figure, and connect  $P$  with corner points  $Q$  and  $R$  as shown.



**STEP 3** Rotate the red and blue triangles as shown.



**STEP 4** The new figure formed is a square with area  $c^2$  square units. It has the combined area of the original squares, so  $c^2 = a^2 + b^2$ .

### EXAMPLE

What is the area of the largest square in the diagram?

#### Solution

The area of the largest square is equal to the sum of the areas of the two smaller squares. The smaller squares have side lengths of 2 units and 3 units, so their areas are  $2^2$  and  $3^2$ , respectively.

$$\text{Area of largest square} = 2^2 + 3^2 = 13$$

► The largest square has an area of 13 square units.

