

## ACTIVITY 12.5

### Developing Concepts

Group Activity for use with Lesson 12.5

# Investigating the Pythagorean Theorem

### GROUP ACTIVITY

Work in a small group.

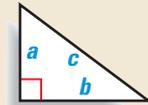
### MATERIALS

- ruler
- scissors
- glue or tape

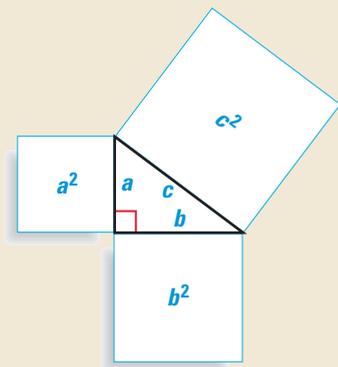
► **QUESTION** Is the Pythagorean theorem true only for right triangles?

### ► EXPLORING THE CONCEPT

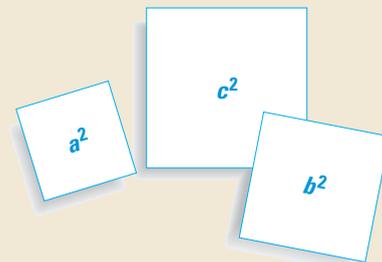
For the right triangle shown,  $a$ ,  $b$ , and  $c$  are the lengths of the sides of the triangle. The Pythagorean theorem states that  $a^2 + b^2 = c^2$ .



1 Copy the triangle on a piece of paper. Draw a square on each of the triangle's three sides. Label the areas  $a^2$ ,  $b^2$ , and  $c^2$ . Then cut out the squares.



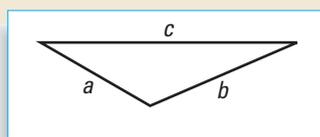
2 Cut and rearrange the areas that represent the squares of  $a$  and  $b$  to see if they fit exactly into the area that represents the square of  $c$ .



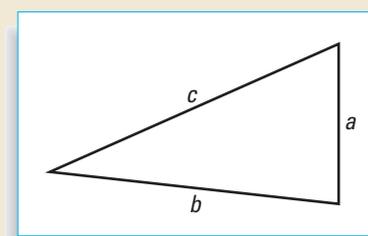
### ► DRAWING CONCLUSIONS

1. Each group member should copy a different one of the triangles below. Then draw the areas that represent the squares of the sides. Cut and rearrange them to see how the larger area relates to the sum of the two smaller areas.

Obtuse triangle



Acute triangle



2. Draw any triangle and follow the directions of Exercise 1.

In Exercises 3–5,  $a$ ,  $b$ , and  $c$  are the lengths of the sides of a triangle, and  $c$  is the greatest length. Use the results of your investigations with triangles to complete the statement with  $>$ ,  $<$ , or  $=$ .

3. In an obtuse triangle,  $a^2 + b^2$   $\underline{\quad}$   $c^2$ .
4. In a right triangle,  $a^2 + b^2$   $\underline{\quad}$   $c^2$ .
5. In an acute triangle,  $a^2 + b^2$   $\underline{\quad}$   $c^2$ .