A Dissection

Name(s): _____

One way to demonstrate the Pythagorean theorem is to cut the squares into pieces so that the pieces of the squares on the legs can be arranged to fit into the square on the hypotenuse (or vice versa). In this activity, you'll learn one such dissection.

Sketch and Investigate

1. Construct a right triangle and squares on the sides.

How can you find the center of a square?

2. Construct the center of the square on side *b*, the larger of the two legs.

To construct a parallel, select a point to go through and a straight object to be parallel to.

3. Construct a line through this center, parallel to side *c*, and another line perpendicular to side *c*.

4. Construct points of intersection of the lines with the sides of the square on side *b*.

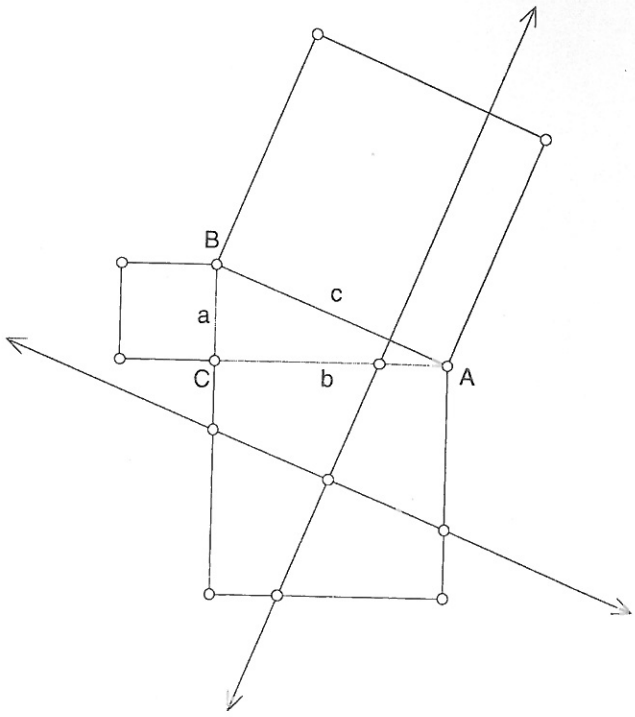
Select the four vertices and choose **Quadrilateral Interior** from the Construct menu.

5. Construct the four quadrilateral interiors of the regions into which the square on side *b* is divided. Give them different shades or colors.

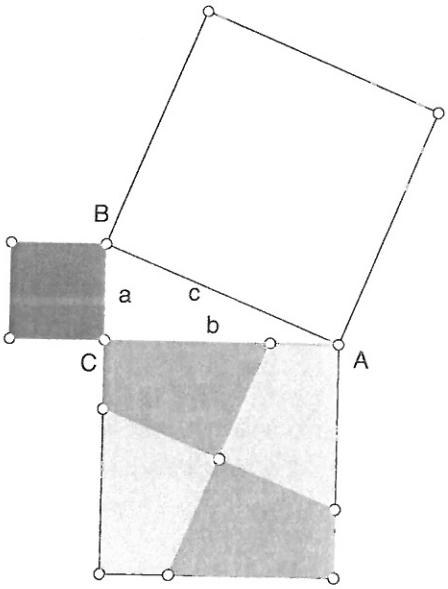
Select the lines, then choose **Hide Lines** from the Display menu.

6. Hide the lines.

7. Construct the interior of the square on *a*, the smallest leg.

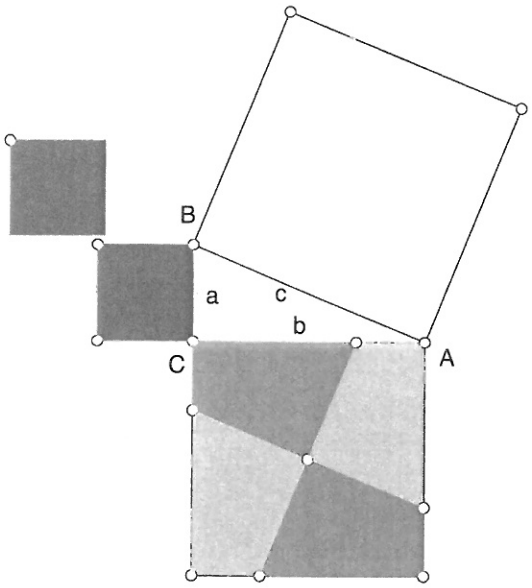


The four pieces of the square on side *b*, combined with the square on side *a*, make five pieces that can be rearranged to fit into the square on side *c*. In the following steps, you'll make translated images of these pieces that you can drag around freely.



8. To create a translated image of the square on side *a*, choose the **Translator** tool from the Custom Tools menu, and click on the following, in order: the interior of the square, a vertex of the square, a blank area (to construct the translated copy). Repeat on the four pieces in the square on side *b*.

9. Now drag each piece into the square on side *c* and see if you can arrange them to perfectly fill this square.



Q1 How does this demonstrate the Pythagorean theorem?

10. To confirm that this dissection works for other right triangles, change the shape of your triangle and refit the pieces.