**Activity 1.1.2 Dissection Proof of Pythagorean Theorem**



**Given**: Right triangle with legs *a* and *b* and hypotenuse *c*. Two squares with side lengths a and b next to each other.

**Prove**: The area of a square with side length *a* (*a2*) plus the area of a square with side length b(*b2*) equals the area of a new square with side length c (*c2*). Proving the Pythagorean Theorem *a2* + *b*2 = *c*2.

P

(Magic Point)

**FIGURE 1**

1. Cut out FIGURE 1.
2. Using a ruler, draw a line segment connecting *Q* and *P*. Draw a segment connecting *P* and *R*.
3. Measure the lengths of $\overbar{PQ}$and $\overbar{PR}$ to the nearest tenths of a centimeter. What did you notice? *This is why point P is the “magic point”*.
4. Cut along the lines you drew for $\overbar{PQ}$and $\overbar{PR}$ creating two triangles.
5. Slide these two triangles to different sides until you create a square.



Now try the same thing with another right triangle. Notice that the ratio of *b* to *a*  is greater than in the triangle on page 1.

1. Cut out FIGURE 2. Follow steps 2 through 5. Will this work for the squares formed by the legs of any right triangle?

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**FIGURE 2**

7. When you have two squares side by side as in figures 1 and 2, how would you locate the magic point?