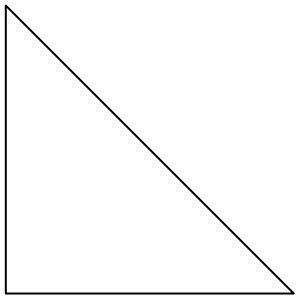
Mathematician:
Date:

The Pythagorean Theorem

Label the legs and hypotenuse of a right triangle.



Use the table below to do the following:

- **Draw a right triangle with the given leg lengths on dot paper.**
- **Draw a square on each side of the triangle.**
- **Find the area of the squares on each side of the triangle.**
- **Record your results in the table.**

Length of Leg 1 (units)	Length of Leg 2 (units)	Area of square On Leg 1 (square units)	Area of square On leg 2 (square units)	Area of Square On Hypotenuse (Square units)
1	1			
1	2			
2	2			
1	3			
2	3			
3	3			
3	4			

A ***conjecture*** is your best guess about a mathematical relationship. It is usually a generalization about a pattern you think might be true.

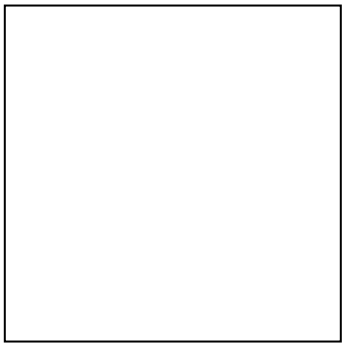
For each triangle, look for a relationship among the areas of the three squares. Make a conjecture about the areas of the squares drawn on the sides of any right triangle.

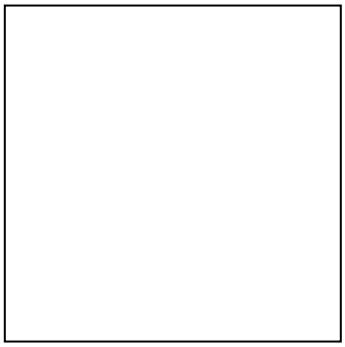
My conjecture (Pythagorean Theorem):

Proof of Pythagorean Theorem

1.) Study a triangle piece and the three square pieces. How do the side lengths of the squares compare to the side lengths of the triangle?

2.) Arrange the 11 puzzle pieces to fit EXACTLY into the two puzzle frames. Use four triangles in each frame. Sketch your puzzle below.





3.) What conclusions can you draw about the relationship among the areas of the three squares?

4.) What does the conclusion you reached in number 3 mean in terms of the side lengths of the triangles?

Extension:

Lengths that form a right triangle

If the dimensions of a triangle satisfy Pythagorean Theorem, then this can be used to identify a triangle as a right triangle. For example if $12^2 + 16^2 = 20^2$, then those would be dimensions of a right triangle.

Complete the table below.

Side Lengths (units)	**Do the side lengths satisfy $a^2 + b^2 = c^2$?**	**Is the triangle a right triangle?**
3, 4, 5	$3^2 + 4^2 = 5^2$; 9 + 16 = 25	YES!
5, 12, 13		
5, 6, 10		
6, 8, 10		
4, 4, 4		
1, 2, 2		