

# Proving the Pythagorean Theorem

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Name: \_\_\_\_\_

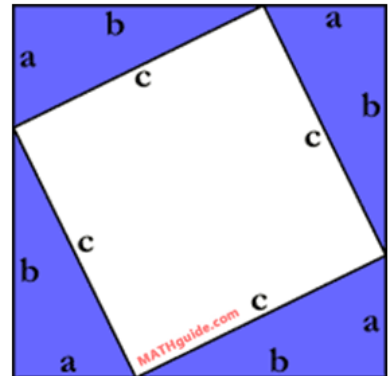
Period: \_\_\_\_\_

**Objective:** Prove the Pythagorean Theorem, CCSS.MATH.CONTENT.HSG.SRT.B.4

**Directions:** Follow the steps below, which will help you to meet the objective.

1) The figure shown to the right is composed of five small shapes. Describe those shapes using geometry vocabulary.

2) Determine the areas of each of the five small shapes. Write these areas as expressions.



3) Now, look at the figure as a large square. Write an expression that represents the length of the side of the square.

4) The area of a square can be found by using the formula  $A = s^2$ , where the "s" stands for the length of the side of a square. Use this formula to write an expression that represents the area of the large square using the length of the side you wrote for problem #3.

$$A = ( \quad )^2$$

5) The expression you wrote for problem #4 can be expanded. For instance,  $(x + 5)(x + 5) = x^2 + 10x + 25$ . Use the same algebra to expand your response for area in problem #4. Show your algebra below.

6) In problems #2 and #5, you arrived at the area of the figure using two different methods. You have two different expressions. These expressions define the same area: the area of the entire figure. So, use an equation to set the two expressions equal to each other.

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7) Explain how you can simplify the equation you wrote in problem #6 to arrive at the Pythagorean Theorem.