

# Proving the Pythagorean Theorem with Paper Squares

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

## LEARNING OBJECTIVE

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Students will construct a hands-on area proof of the Pythagorean Theorem using paper squares built on the sides of a right triangle.

## MATERIALS NEEDED

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- graph paper or grid paper
- ruler
- scissors
- pencil
- colored pencils
- glue stick or tape
- plain paper

## HANDS-ON ACTIVITY

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1. On graph paper, draw a right triangle with legs of 3 units and 4 units, and measure/draw the hypotenuse connecting them.
2. On the same or separate graph paper, carefully draw and cut out three squares: one 3x3 (9 sq units), one 4x4 (16 sq units), and one 5x5 (25 sq units) -- using your ruler to keep edges exact.
3. Arrange the two smaller squares (3x3 and 4x4) so each sits exactly against one leg of your triangle, and the large square (5x5) sits against the hypotenuse. Glue or tape all three onto a plain sheet of paper in this arrangement.
4. Count and record the total area of the two smaller squares combined ( $9 + 16$ ), and compare it to the area of the large square (25).
5. Write the Pythagorean Theorem ( $a^2 + b^2 = c^2$ ) next to your diagram and label which square represents  $a^2$ ,  $b^2$ , and  $c^2$ .

## QUESTIONS

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1. What is the combined area of the two smaller squares, and how does it compare to the area of the largest square?
  2. State the Pythagorean Theorem in your own words and identify what  $a$ ,  $b$ , and  $c$  represent.
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**3. Why does this theorem only work for right triangles?**

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**4. If a right triangle has legs of 6 and 8, use the theorem to find the hypotenuse. Show your work.**

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