

The Pythagorean Theorem

Learning Goal:

By the end of today, I will be able to use the Pythagorean theorem to calculate a missing side in a right triangle.

On the graph paper provided, cut out a three squares. The smallest square will be 9x9, the, the largest will be 15x15, and the last will be 12x12.

Arrange the three squares so that two their vertices are contacting the other two squares.

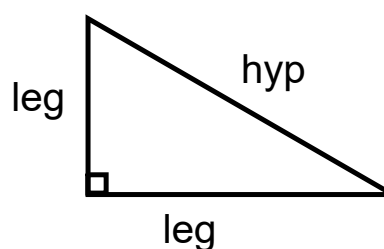
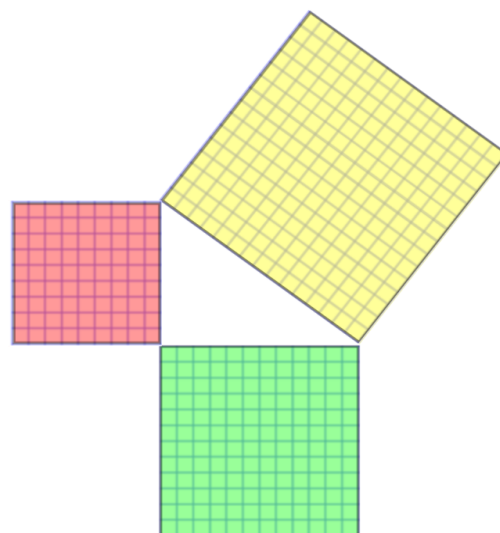
What shape do you see within?

Place the 12x12 square on top of the largest, 15x15 square. Count the number of squares that are NOT covered up. What do you notice?

The Pythagorean Theorem is based on this relationship.

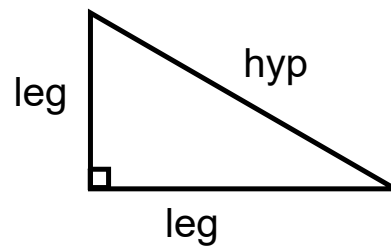
The sum of the squares (areas) of each **leg** of a RIGHT triangle is equal to the square (area) of the **hypotenuse**.

Notice, the hypotenuse can NEVER be shorter than either leg of the triangle.



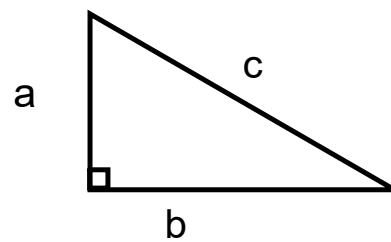
We write this in a shorter manner for simplicity.

$$leg^2 + leg^2 = hyp^2$$



or

$$a^2 + b^2 = c^2$$



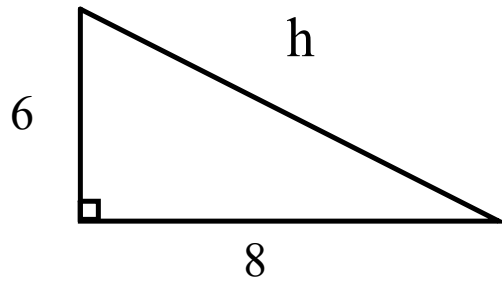
Note, the last statement can be misleading if the letters used are not in the correct position. Be careful.

GSP Demos

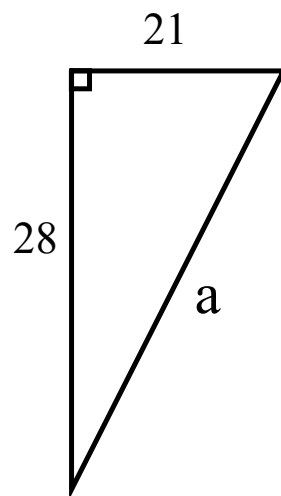
 Example 1

 Example 2

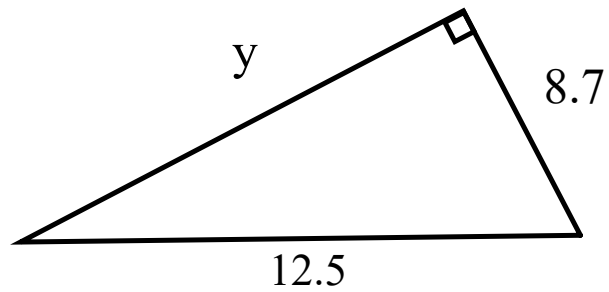
Find the missing side length (draw the squares on each side if necessary)



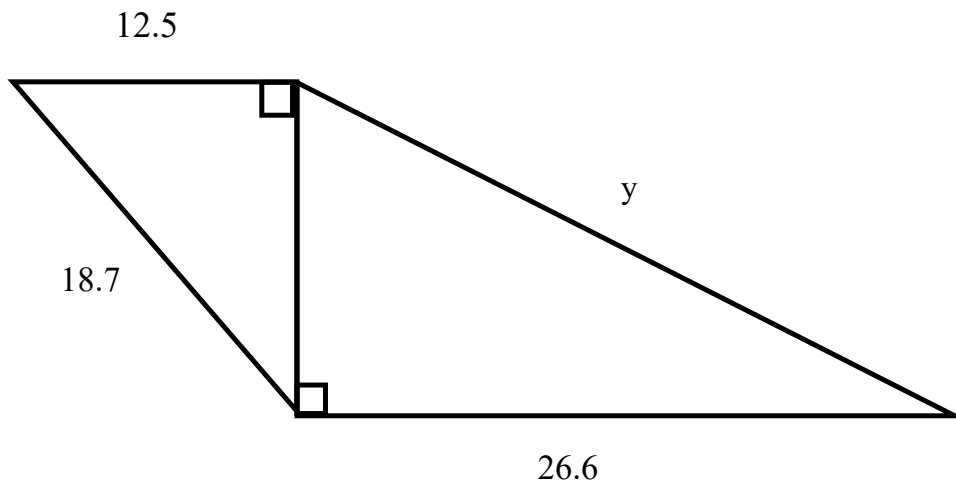
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Find the missing side length (draw the squares on each side if necessary)

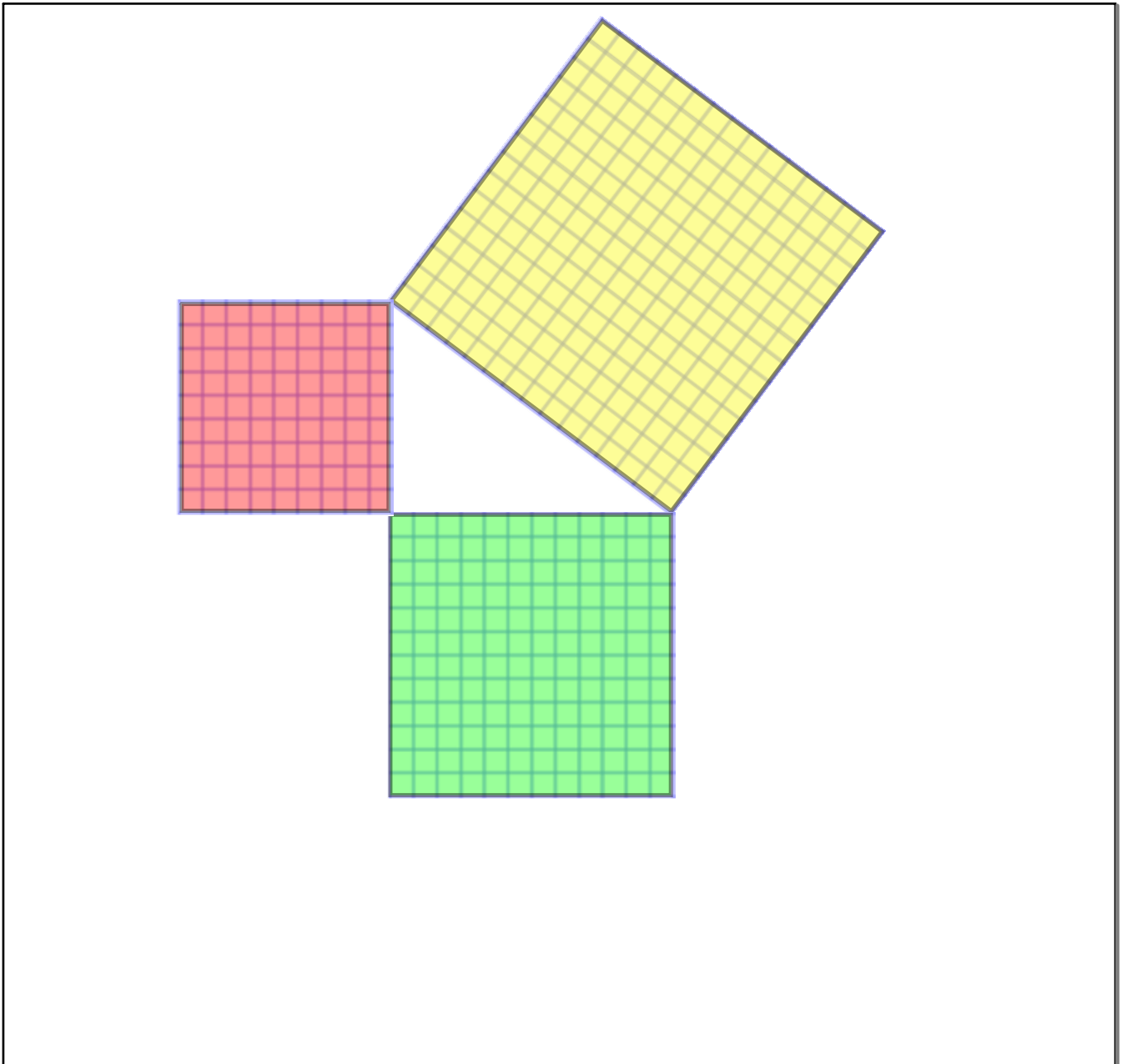


Find the missing side length (round to two decimal places)



Consolidation Questions:

Grade 9 Academic - page 445-7 #1, 3, 5, 8, 11



Attachments

Pythagorean Theorem.gsp

Dissected Pythagoras.gsp