# The Pythagorean Theorem Conjecture
Due Monday, April 1, 2013

The Pythagorean Theorem states that for a right triangle with legs **a** and **b** and hypotenuse **c**, we have the Pythagorean Equation:

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

If we think of this geometrically, we are saying that the sum of the areas of the squares drawn on the two legs, as shown to the right, is equal to the area of the square drawn on the hypotenuse. This is the traditional Pythagorean result, both algebraically and geometrically.
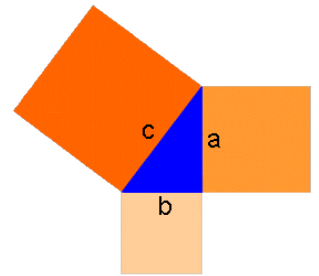
The question is can we place any **regular polygons** (triangles, pentagons, hexagons, circles, etc.) in place of the squares and get the same result?

1. Find the area of each circle (A, B, C) (6 points). What do you notice about the sum of the areas of circles A and B compared to the area of circle C (2 points)? *Show your work!*

Circle C with diameter 5

Circle B with diameter 4

Circle A with diameter 3
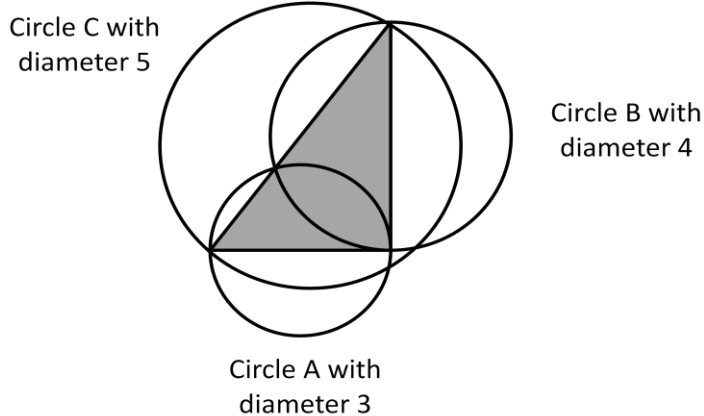
2. Find the area of each triangle (A, B, C) (6 points). What do you notice about the sum of the areas of triangles A and B compared to the area of triangle C (2 points)? *Show your work!*

Triangle B
base = 4
height = 2

Triangle C
base = 5
height = 2.5

h

h

h

Triangle A
base = 3
height = 1.5
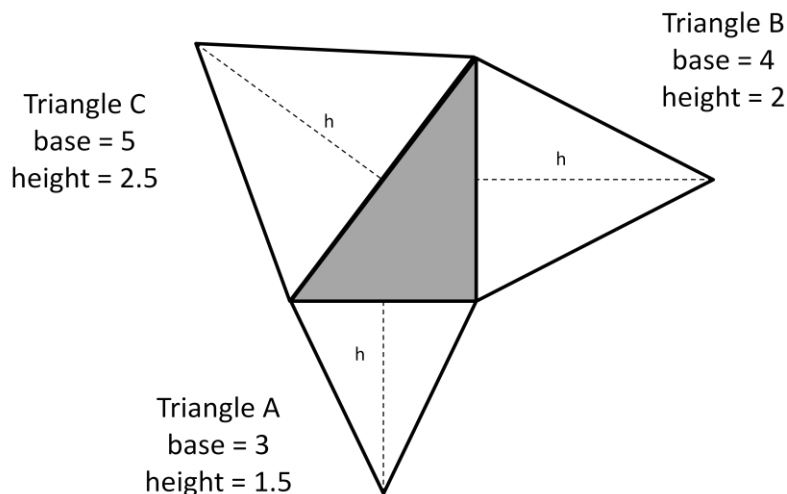
3. A conjecture is an inference using what we know to make an educated guess similar to a hypothesis. Based on your results of problems 1 and 2 as well as your knowledge of the Pythagorean Theorem, create a conjecture regarding the Pythagorean equation and any regular polygons. Tell me why you believe your conjecture to be true (4 points).