

# Short Writing Exercise #1 Revisited

The Famous Theorem  $a^2 + b^2 = c^2$ .

Pathagoras was a very famous Greek mathematician of antiquity who is known for his very famous theorem which he proved in ancient times,  $a^2 + b^2 = c^2$ . This is a truly amazing fact about triangles and is used all the time today in widespread applications. We are going to show you how to prove it by verbally describing a pictorial proof.

Take a large square with four sides of equal length, say  $a + b$  for each side. Draw a vertical line distance  $a$  from the bottom left hand corner of the square, say about  $4/7$  of the way from the left to right. Now draw a horizontal line across the square, say  $a$  units from the top left. The lines divide the large square into four smaller squares. There is a square of area  $a^2$ , a square of area  $b^2$  and two squares of area  $ab$ .

Now take the same square. Walk around the square, starting from the lower left hand corner, clockwise, marking of points of distance  $a$  from the corners. Now connect these four points. You have a square of area  $c^2$ . The remaining area consists of four triangles with side lengths  $a$  and  $b$  and hypoteneus  $c$ . The squares with area  $ab$  in the first square are really two triangles with side lengths  $a$  and  $b$  and hypoteneus  $c$ . Therefore  $a^2 + b^2 = c^2$ .