MY FAVORITE THEOREM

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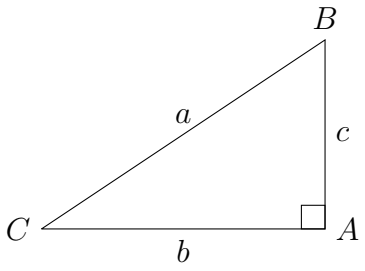
PYTHAGOREAN THEOREM

It states that,the square of a plus the square of b is equal to the square of c.

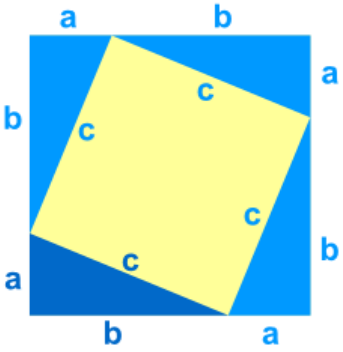
$$a^2 + b^2 = c^2 \tag{1}$$



PROOF USING ALGEBRA

We can show that $a^2 + b^2 = c^2$ using Algebra.

Take a look at the diagram below.



1 Area of Whole square

Each side of the square has a length of $a + b$

$$A = (a + b)(a + b) \tag{2}$$

2 Area of the Pieces

2.1 First, the smaller(tilted) square has an Area

$$A = c^2 \tag{3}$$

2.2 And there are four triangle,each one of them has an Area

$$A = \frac{1}{2}ab \tag{4}$$

So all four of them combined

$$A = 4(\frac{1}{2}ab) = 2ab \tag{5}$$

2.3 Adding up the Area of the tilted square and the Area of the 4 Triangles

$$A = c^2 + 2ab \tag{6}$$

3 Conclusion

Let the Area of the Whole Square be Equal to the Area of the Pieces

$$(a + b)(a + b) = c^2 + 2ab \tag{7}$$

$$a^2 + 2ab + b^2 = c^2 + 2ab \tag{8}$$

$$a^2 + 2ab + b^2 - 2ab = c^2 + 2ab - 2ab \tag{9}$$

$$a^2 + b^2 = c^2 \tag{10}$$

NOW WE SEE HOW PYTHAGOREAN THEOREM WORKS