Pythagorean Theorem

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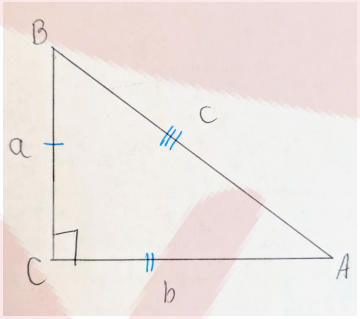
Pythagorean Theorem

The Pythagorean Theorem of Theorem of Pythagorus is a theorem or rule that related the lengths of the sides of a right angled triangle. First some definitions. A right angled triangle is a traingle with one 90° angle. The side opposite the 90° angle is called the *hypontenuse*, h. Let's choose one of the other angles in the triangle and label it as θ. The side beside the angle θ is called the *adjacent* side, a. The side opposite the angle θ is called the *opposite* side, o. There is a relationshiop between the three sides of a right angled triangle called the *Theorem of Pythagorus*.

Pythagorean Theorem



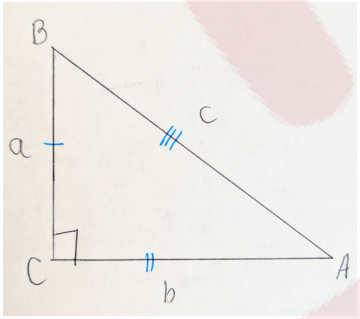
Pythagorean Theorem

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

Let's have a look at an example to see the application of the Theorem of Pythagorus.

Example

For the following triangle, where $a = 4cm$ and $b = 3cm$ find the missing side using the theorm of Pythagorus.



Solution: The side we are looking for is opposite the right angle, or the hypotenuse. By the theorm of Pythagorus in equation (1), we have,

$$\begin{aligned} c^2 &= a^2 + b^2 \\ &= 4^2 + 3^2 \\ &= 16 + 9 \\ &= 25 \\ \therefore c &= \sqrt{25} \\ c &= 5cm \end{aligned}$$

Therefore, the length of the missing side, or the hypotenuse, is $5cm$.

Exercises

Use the pythagorean Theorem to find the missing side length in the following right angled triangles.