# S.P.V.V.S.S
# G.P.PORWAL ARTS COMMERCE AND V V SALIMATH SCIENCE COLLEGE SINDAGI – 586128

Dist: Vijaypura

State: Karnataka

## DEPARTMENT OF MATHEMATICS

## PROJECT WORK

This is to certify that students of B. Sc I SEM participated in Mathematics Project work on Mathematics Day 2022-23. Model on *Pythagoras Theroem* _____ satisfactorily completed their work under my supervision at our college under Rani Chennamma University Belagavi.

**Participated Students**

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# PYTHAGOREN THEOREM

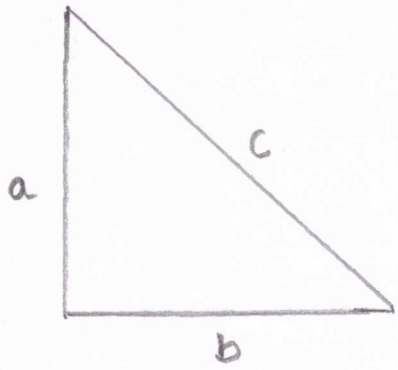
## INTRODUTION

pythagoreas theorem also called pythagorean theorem is an important topic in Mathematics, which Explains the relation between the sides of a right angled triange. The sides of the right triangle are also called phythagorean triples, the formula and proof of this theorem are Explained here with Examples.

Pythagoras theorem is basically used to find the length of an unknown side and the angle of a triangle. By this theorem, we can derive the base, perpendicular and hypotenuse formula. Let us learn the mathematics of the pythagorean theorem. in detail here.

## Pythagoras Theorem statment

Pythagoras theorem states that "In a right angled triangle, the Square of the hypotenuse side is equal to the Sum of squares of the other two sides". The sides of this triangle have been named perpendicular, Base and Hypotenuse. Here, the hypotenuse is the longest side, as it is opposite to the angle 90°. The sides of a right triangle (say a, b and c) which have positive integer values, when squared, are put into an equation, also called pythagorean triple.




## History

The pythagoras theorem is named after a Greek Mathematician called pythagoras.

# Pythagoras Theorem proof

Given: A right-angled triangle ABC, right-angled at B.

To prove - $AC^2 = AB^2 + BC$

Construction: Draw a perpendicular BD meeting AC at D

Proof

We know, $\Delta ADB \sim \Delta ABC$

Therefore,

$\frac{AD}{AB} = \frac{AB}{AC}$

(Corresponding sides of similar triangles)

or, $AB^2 = AD \times AC$ --- (1)

Also $\Delta BDC \sim \Delta ABC$

Therefore

$\frac{CD}{BC} = \frac{BC}{AC}$

(Corresponding sides of similar triangles)

or, $BC^2 = CD \times AC$ ---- (2)

Adding the equation (1) and (2) weget,

$AB^2 + BC^2 = AD \times AC + CD \times AC$

$AB^2 + BC^2 = AC(AD + CD)$

Since, $AD + CD = AC$

Therefore, $AC^2 = AB^2 + BC^2$

Hence, the pythagorean theorem is proved.

# Application of Pythagoras theorem

- To know if the triangle is a right angled triangle or not.
- In a right angled triangle, we can calculate the length of any side if the othe two sides are given.
- To find the diagonal of a Square.

## Useful for

Pythagoras theorem is useful to find the sides of a right-angled triangle. If we know the two sides of a right triangle, then we can find the third side.

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