

Pythagorean Theorem
Word problems 1

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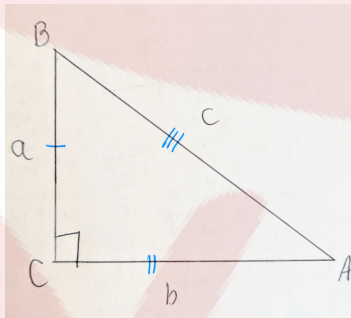
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Pythagorean Theorem

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 relationship between the three sides of a right angled triangle called the *Theorem of Pythagorus*.

Pythagorean Theorem



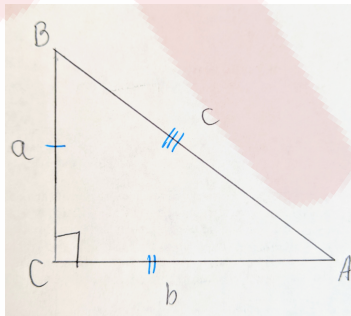
Pythagorean Theorem

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

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

Example

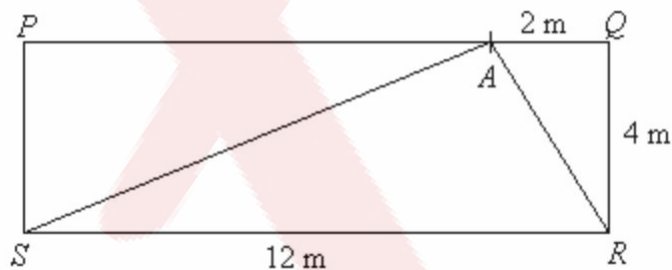
For the following triangle, find the missing side using the theorm of Pythagorus.



Solution: The side we are looking for is opposite the right angle.

Exercises

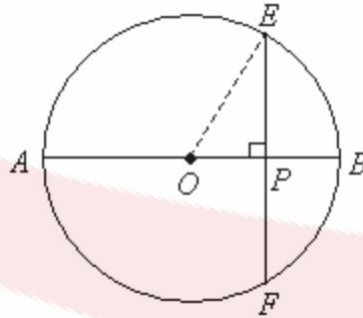
1. A person has to walk 100m to go from position X in the north of east direction to the position B and then to the west of Y to reach finally at position Z. The position Z is situated at the north of X and at a distance of 60m from X. Find the distance between X and Y.
2. If the square of the hypotenuse of an isosceles right triangle is 128cm^2 , find the length of each side.
3. Find the perimeter of a rectangle whose length is 150 m and the diagonal is 170 m.
4. A ladder 13 m long is placed on the ground in such a way that it touches the top of a vertical wall 12 m high. Find the distance of the foot of the ladder from the bottom of the wall.
5. The height of two buildings are 34 m and 29 m, respectively. If the distance between the two buildings is 12 m, find the distance between their tops.
6. Shane marched 3 m east and 6 m north. How far is he from his starting point?
7. The rectangle PQRS represents the floor of a room.



Ivan stands at point A. Calculate the distance of Ivan from

- a) the corner of R of the room.
 - b) the corner of S of the room.
8. The main mast of a fishing boat is supported by a sturdy rope that extends from the top of the mast to the deck. If the mast is 20 feet tall and the rope attached to the deck 15 feet away from the base of the mast, how long is the rope?

9. In the following diagram of a circle, O is the centre and the radius is 12 cm. AB and EF are straight lines. Find the length of EF if the length of OP is 6 cm.



10. A soccer field is a rectangle 90 metres wide and 120 metres long. The coach asks players to run from one corner to the corner diagonally across the field. How far do the players run?
11. How far from the base of the house do you need to place a 15' ladder so that it exactly reaches the top of a 12' wall?