Pythagorean Theorem
Word Problesm 3

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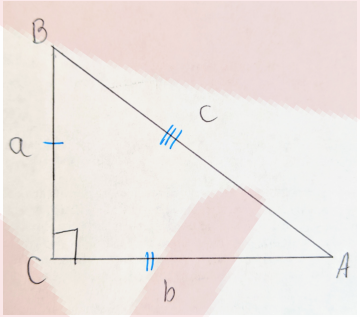
2020

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



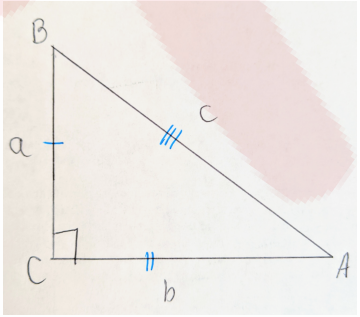
Pythagorean Theorem

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

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. The diagonal of a rectangle is 25 inches. The width is 15 inches. What is the area of the rectangle?
2. What is the length of the diagonal of a 10cm by 15 cm rectangle?
3. A 13 foot ladder is placed 5 feet away from the wall. The distance from the ground straight up to the top of the wall is 13 feet. Will the ladder reach the top of the wall?
4. John leaves school to go home. He walks 6 blocks north and then 8 blocks west. How far is john from the school?
5. Mitchell takes a rectanglur piece of fabric and cuts from one corner to the opposite corner. If the piece of fabric is 12 cm long and 16 cm wide, how long is the diagonal cut that Mitchell made?
6. Two cars start from the same intersection with one traveling southbound while the other travels east bound going 10 mph faster. If after two hours they are $10\sqrt{34}$ miles apart, how fast was each car traveling?
7. Shari went to a level field to fly a kite. She let out all 650 feet of the string and tied it to a stake. Then, she walked out on the field until she was directly under the kite, which was 600 feet from the stake. How high was the kite from the ground?
8. Two cyclsts start from the same location. One cyclist travels dur north and the other due east, at the same speed. Find the speed of each in miles per hour if after two hours they are $17\sqrt{2}$ miles apart.