PYTHAGOREAN THEOREM

ANSWERS

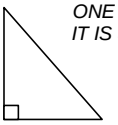
PYTHAGOREAN THEOREM

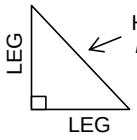
$a^2 + b^2 = c^2$

THE ***PYTHAGOREAN THEOREM*** SHOWS THE RELATIONSHIP BETWEEN THE LEGS (SHORTER LENGTHS) AND THE HYPOTENUSE (LONGEST SIDE) OF A RIGHT TRIANGLE.

THIS IS A RIGHT TRIANGLE.

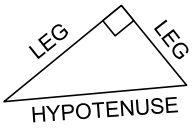
ONE ANGLE EQUALS 90 DEGREES.
IT IS SHOWN BY A SMALL SQUARE.



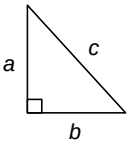


HYPOTENUSE
IT'S ALWAYS OPPOSITE THE RIGHT ANGLE.
IT'S ALWAYS THE LONGEST SIDE.

EXAMPLES OF RIGHT TRIANGLES



THE ***PYTHAGOREAN THEOREM*** CAN BE WRITTEN AS AN EQUATION WHERE ***a*** AND ***b*** ARE THE LEGS AND ***c*** IS THE HYPOTENUSE. THE EQUATION TELLS US THAT IF WE SQUARE THE LEGS AND THEN ADD THEM TOGETHER THEY WILL EQUAL THE SQUARE OF THE HYPOTENUSE.

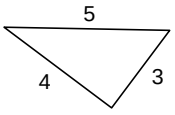


RIGHT TRIANGLE.

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

THIS ONLY WORKS FOR A RIGHT TRIANGLE.

Example #1



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

$3^2 + 4^2 = 5^2$

$(3 \times 3) + (4 \times 4) = (5 \times 5)$

$9 + 16 = 25$

$25 = 25$

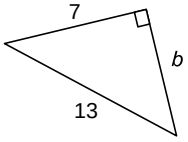
YOU CAN SHOW WHETHER OR NOT A TRIANGLE IS A RIGHT TRIANGLE.

25 EQUALS 25. THIS TELLS US THE TRIANGLE IS A RIGHT TRIANGLE.

PYTHAGOREAN THEOREM

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

Example #2



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

$7^2 + b^2 = 13^2$

$(7 \times 7) + b^2 = (13 \times 13)$

$49 + b^2 = 169$

$49 + b^2 = 169 - 49$

$b^2 = 120$

b is about 11

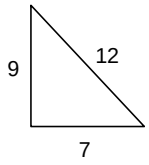
10 x 10 = 100
AND
11 X 11 = 121

YOU CAN FIND THE LENGTH OF A MISSING SIDE OF A RIGHT TRIANGLE.

ROUND THE APPROXIMATION TO THE NEAREST WHOLE NUMBER.

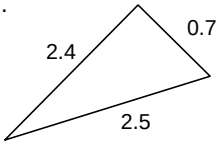
Now your turn. Use the Pythagorean Theorem to show if the triangle is a right triangle. See example #1.

1.



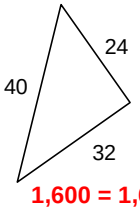
130 ≠ 144
NO

2.



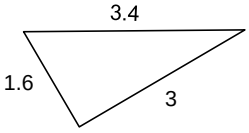
6.25 = 6.25
RIGHT TRIANGLE

3.



1,600 = 1,600
RIGHT TRIANGLE

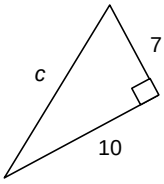
4.



11.56 = 11.56
RIGHT TRIANGLE

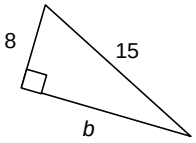
Find the missing side for each right triangle. Estimate the answer to the nearest whole number. See example #2.

5.



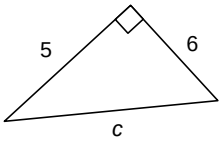
c **about 12**

6.



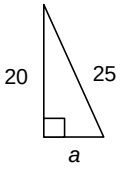
b **about 13**

7.



c **about 8**

8.



a **= 15**

Solve the word problem.

9.

Fire Man Carry needs a ladder to reach the second floor window of an old warehouse. The window is 15 feet straight up, but there is debris and fire all around the building so he will need to place the ladder 8 feet away from the building. How long does the ladder need to be to reach the window?

The ladder should be about 17 feet long.