1/30/20 - Warm Up Problem

Write each square root in simplified radical form.

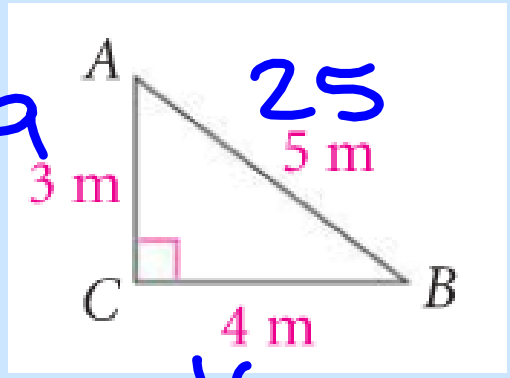
1. $\sqrt{52}$ $2\sqrt{13}$ $\sqrt{4 \cdot 13}$

2. $\sqrt{13}$ $1\sqrt{13}$

3. $\sqrt{256}$ 16 $\sqrt{256}$ $\sqrt{64 \cdot 4}$

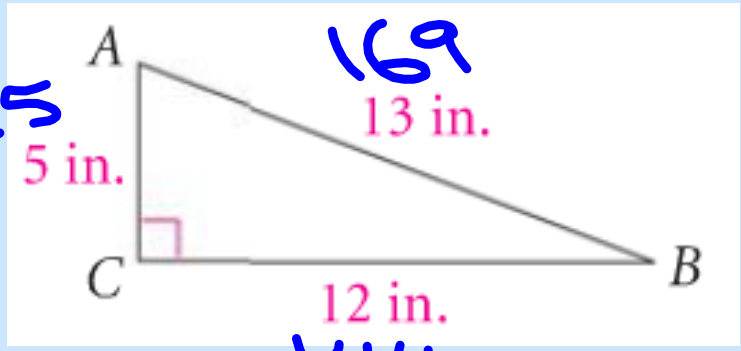
4. $\sqrt{192}$ $\sqrt{64 \cdot 3}$ $8\sqrt{3}$

Square the lengths of each side of each triangle.
What do you notice?



9 25 16

9+16=25



25 169 144

25+144=169

Section 8.1 - The Pythagorean Theorem

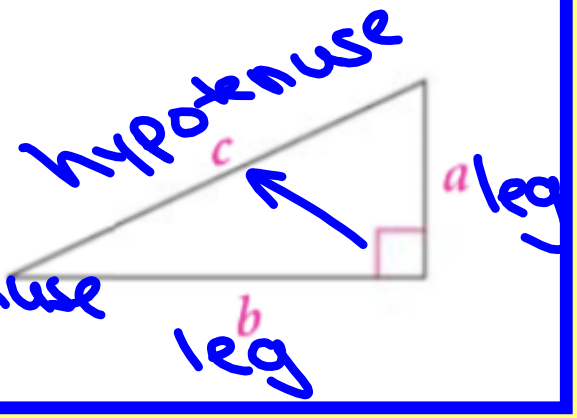
Goal: Use the Pythagorean Theorem to find missing side lengths and to classify triangles

Pythagorean Theorem

If a triangle is a right triangle, then the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.

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

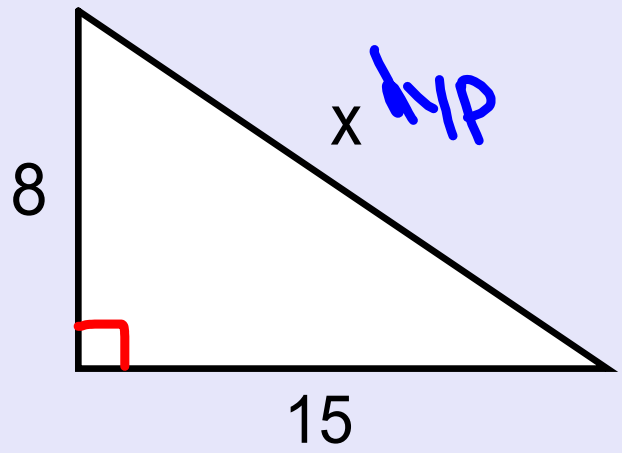
legs legs hypotenuse



Using the Pythagorean Theorem

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

leg leg hypotenuse



$8^2 + 15^2 = x^2$

$64 + 225 = x^2$

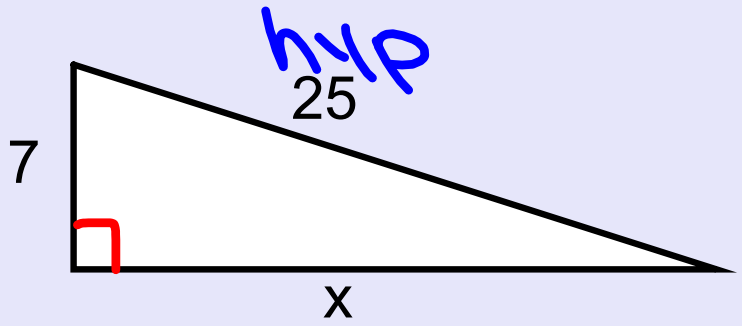
$\sqrt{289} = \sqrt{x^2}$

$17 = x$

Using the Pythagorean Theorem

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

leg leg hypotenuse



$7^2 + x^2 = 25^2$

$49 + x^2 = 625$

$-49 \quad -49$

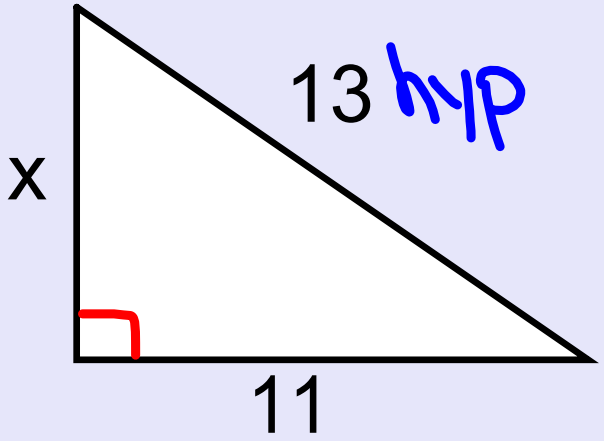
$\sqrt{x^2} = \sqrt{576}$

$x = 24$

Writing in Simplified Radical Form

Find the value of x. Write your answer as a decimal and in simplified radical form.

Do this one in your notes.



$x^2 + 11^2 = 13^2$

$x^2 + 121 = 169$

$-121 \quad -121$

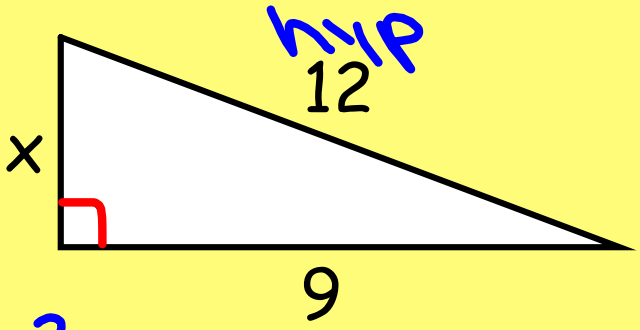
$\sqrt{x^2} = \sqrt{48}$

$\sqrt{16 \cdot 3}$

$x = 6.9$ or $4\sqrt{3}$

Try it on your own...

Find the value of x. Write your answer in simplifed radical form if necessary.



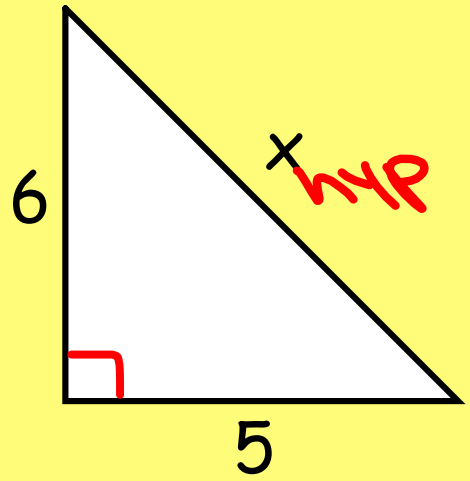
$x^2 + 9^2 = 12^2$

$x^2 + 81 = 144$

$-81 \quad -81$

$\sqrt{x^2} = \sqrt{63}$

$x \approx 7.9$



$6^2 + 5^2 = x^2$

$36 + 25 = x^2$

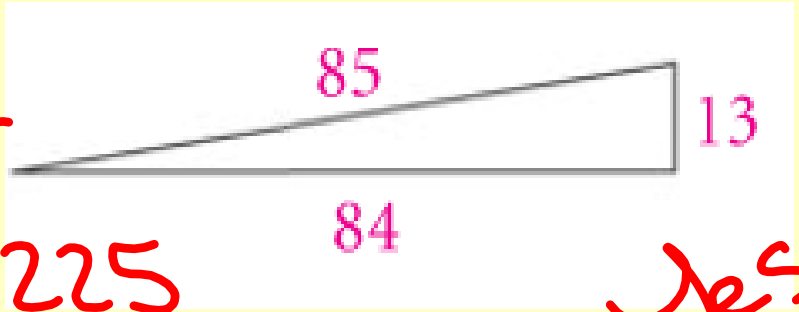
$\sqrt{61} = \sqrt{x^2}$

$7.8 = x$

Converse of the Pythagorean Theorem

If the sum of the squares of the lengths of two sides of a triangle is equal to the square of the length of the third side, then the triangle is a right triangle.

Is this a right triangle?



$84^2 + 13^2 = 85^2$

$7056 + 169 = 7225$

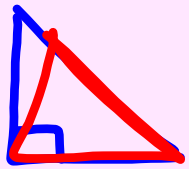
$7225 = 7225$

yes

Are these right triangles?

If a triangle has sides of 16, 48, and 50?

NO

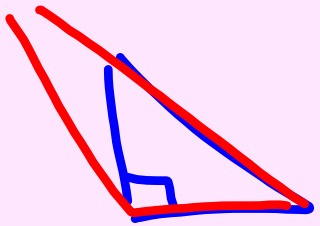


$16^2+48^2=50^2$

$2560 \neq 2500$

If a triangle has sides of 6, 11, and 14?

NO



$6^2+11^2=14^2$

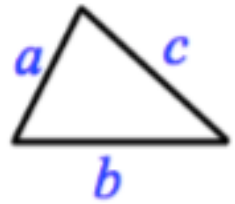
$157 < 196$

CLASSIFYING TRIANGLES

If $a^2 + b^2 = c^2$, then the triangle is right.

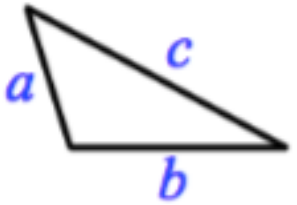
If $a^2 + b^2 > c^2$, then the triangle is acute.

↑ hyp. is too short



If $a^2 + b^2 < c^2$, then the triangle is obtuse.

↑ hyp. is too big



Classify these triangles in your notes.

Would the sides form a right, acute, or obtuse triangle?

1. 7, 4, 6

$4^2+6^2=7^2$

$52>49$

Acute

2. 15, 20, 25

$15^2+20^2=25^2$

$625=625$

Right

3. 10, 15, 20

$10^2+15^2=20^2$

$325<400$

Obtuse

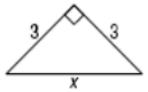
Assignment:

Concept 19 Worksheet
(13-24)

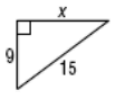
THE PYTHAGOREAN THEOREM: $a^2 + b^2 = c^2$

Find the value of x. Write your answers in simplified radical form if necessary.

13.



14.



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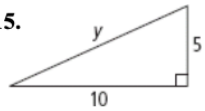
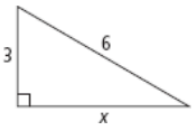


16.



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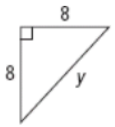

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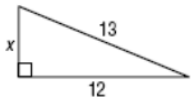

CONVERSE OF THE PYTHAGOREAN THEOREM

Use the Pythagorean Theorem to determine if each set of sides would form a right , acute, or obtuse triangle. You must show your work.

19. 19, 20, 28

20. 8, 24, 25

21. 33, 56, 65

22. 4, 5, 6

23. 5, 6, 10

24. 8, 15, 17