Math 9 – Unit 3: Solving Equations

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Lesson #6: Pythagorean Theorem

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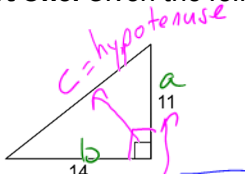
Learning Goal: We are learning to use the Pythagorean Theorem to solve for missing sides in right-angled triangle.

The infamous Pythagorean Theorem is essentially an equation. As long as we have enough information, we can use it to solve.

Part One: Given the following triangles, label the sides a, b, and c, then solve for the missing side.

1.



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

must be right triangles

$11^2+14^2=c^2$

$121+196=c^2$

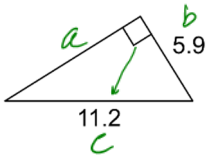
$\sqrt{317}=\sqrt{c^2}$

$17.8=c$

$\sqrt{16}=\sqrt{4^2}$

$=4$

2.



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

$a^2+5.9^2=11.2^2$

$a^2+34.81=125.44$

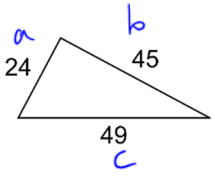
$-34.81 \quad -34.81$

$\sqrt{a^2}=\sqrt{90.63}$

$a=9.5$

Part Two: Given the following triangles, use the Pythagorean Theorem to prove whether or not the triangle is a right-angled triangle. First, label the sides.

1.



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

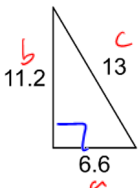
$24^2+45^2 \stackrel{?}{=} 49^2$

$576+2025 \stackrel{?}{=} 2401$

$2601 \neq 2401$

Not a right angled triangle.

2.



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

$6.6^2+11.2^2 \stackrel{?}{=} 13^2$

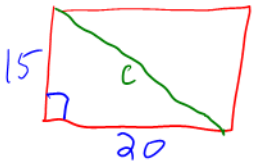
$43.56+125.44 \stackrel{?}{=} 169$

$169=169$

A right angled triangle

Part Three: Read the question twice. Draw the situation (probably utilizing a right-angled triangle). Label the information that you know. Solve for the missing side. ~~Write the answer to the question in the sentence.~~

1. A television screen is described in terms of the diagonal measure of its screen. If a TV screen is 20 inches wide and 15 inches high, what is the length of its diagonal (and hence, the size of the TV)?



b corner to opposite corner

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

$15^2 + 20^2 = c^2$

$225 + 400 = c^2$

$\sqrt{625} = \sqrt{c^2}$

$25 = c$

∴ the TV has a 25 inch screen.

Success Criteria:

- I can use the Pythagorean Theorem to solve for a missing side in a triangle.