MTH1W

Math 9 – Unit 3: Solving Equations

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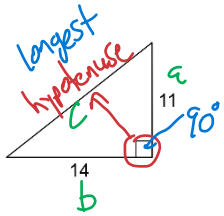
Lesson #3.5: Pythagorean Theorem

Date: Dec 14, 2022

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. 

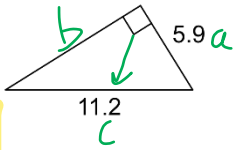
$a^2 + b^2 = c^2$ ← hypotenuse

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

$121 + 196 = c^2$

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

$17.8 = c$

2. 

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

$5.9^2 + b^2 = 11.2^2$

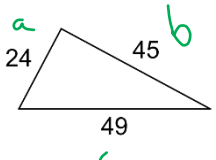
$34.81 + b^2 = 125.44$

$-34.81 \quad -34.81$

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

$b = 9.5$

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. 

use the a and b to see what c you get.

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

$24^2 + 45^2 = c^2$

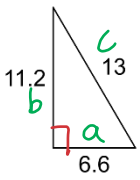
$576 + 2025 = c^2$

$\sqrt{2601} = \sqrt{c^2}$

$51 = c$

$51 \neq 49$

∴ not a right triangle.

2. 

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

$6.6^2 + 11.2^2 = c^2$

$43.56 + 125.44 = c^2$

$\sqrt{169} = \sqrt{c^2}$

$13 = c$

∴ this IS a right triangle.

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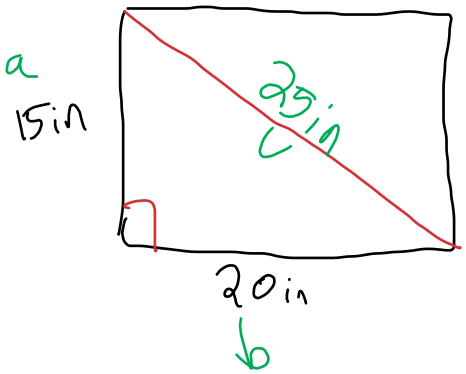
Part Three: Read the question twice. Draw the situation (probably utilizing a right-angled triangle). Label the information that you know. Solve for the missing side. Write the answer to the question in the sentence.

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)?



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

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

$$225 + 400 = c^2$$

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

$$25 = c$$

$\therefore$ this tv is a 25 in TV.

Success Criteria:

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