MTH1W

Math 9 – Unit 3: Solving Equations

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Lesson #3.5: Pythagorean Theorem

Date: Oct 8, 2021

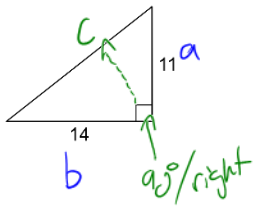
Learning Goal: We are learning to use the Pythagorean Theorem to solve for missing sides in right-angled triangle.

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

$a^2+b^2=c^2$ → hypotenuse, the longest side.

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

1.



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

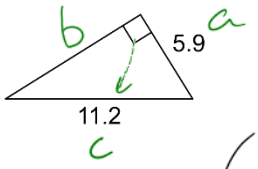
$11^2+14^2=c^2$

$121+196=c^2$

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

$17.8=c$

2.



$b^2=c^2-a^2$

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

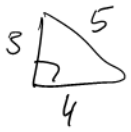
$5.9^2+b^2=11.2^2$

$34.81+b^2=125.44$

$-34.81 \quad -34.81$

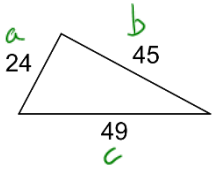
$\sqrt{b^2}=\sqrt{90.63}$

$b=9.5$



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.



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

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

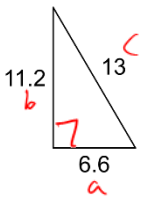
$576+2025=c^2$

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

$51=c$

$\therefore 51 \neq 49$ so not a right triangle.

2.



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

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

$43.56+125.44=c^2$

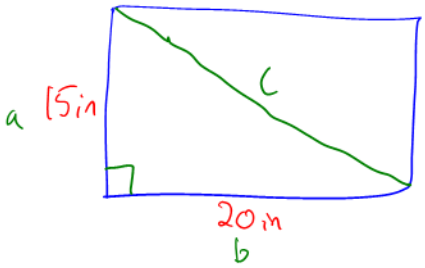
$\sqrt{169}=\sqrt{c^2}$

$13=c$

YES, this is a right 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)?



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

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

$225+400=c^2$

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

$25=c$

∴ This TV is 25 inches.

Success Criteria:

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