Name: _____ Math _____, Period _____

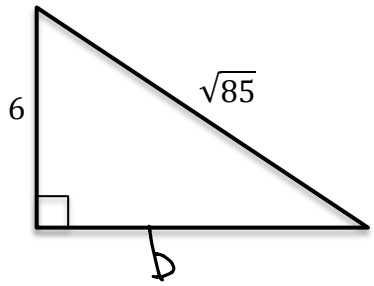
Mr. Rogove Date: _____

Learning Objective: We will apply the Pythagorean Theorem and its converse to solve problems. (G8M7L10)

Activating Prior Knowledge:

We know how to apply the Pythagorean Theorem to find the lengths of sides of right triangles.

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



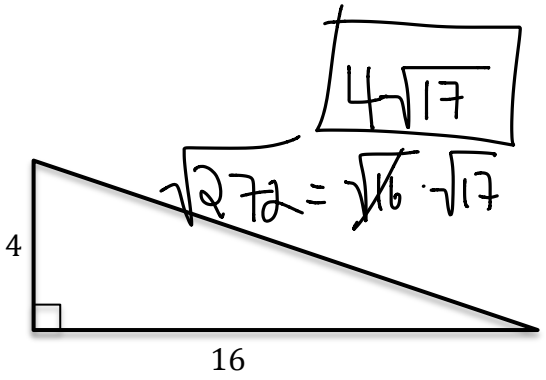
$6^2+b^2=(\sqrt{85})^2$

$36+b^2=85$

$-36 \quad -36$

$b^2=49$

$b=7$



$\sqrt{272}=\sqrt{16}\cdot\sqrt{17}$

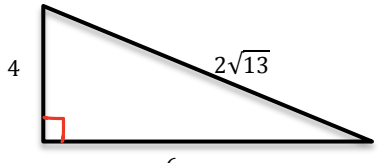
$4\sqrt{17}$

Concept Development:

The Converse of the Pythagorean Theorem

If the lengths of three sides of a triangle, a, b and c satisfy $a^2 + b^2 = c^2$, then the triangle is a right triangle, and furthermore, the side of length c is opposite the right angle (it's the hypotenuse).

Example: Can we prove that the triangle below is a right triangle? Why/Why not?

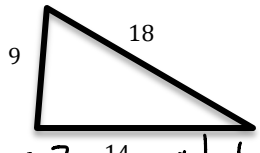


$4^2+6^2=(2\sqrt{13})^2$ Yes!

$16+36=4\cdot13$ Right Δ.

$52=52$

Non-Example: Can we prove that the triangle below is a right triangle? Why/Why not?



$9^2+14^2\overset{?}{=}18^2$ No! Not Rt Δ.

$81+196\neq324$ Because $a^2+b^2\neq c^2$

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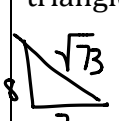
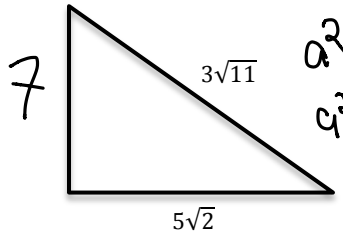
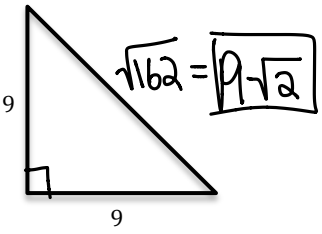
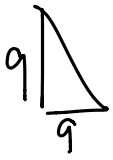
Guided Practice:

Steps for Identifying a Right Triangle

1. Identify the lengths of the sides of a triangle.
2. Determine if the sum of the squares of the lengths of the 2 shorter sides is equal to the square of the longest sides.

2a. If yes to above, then you triangle is a right triangle, and the longest side is the hypotenuse, located opposite the right angle.

2b. If no to above, then you do not have a right triangle.

Is the triangle with side lengths of 3 inches, 8 inches and $\sqrt{73}$ inches a right triangle? Why or why not?  $3^2+8^2=(\sqrt{73})^2$ $9+64=73$ Yes, because $a^2+b^2=c^2$	Is the triangle with side lengths of 1 meter, 4 meters, and $\sqrt{17}$ meters a right triangle? Why or why not? $1^2+4^2=(\sqrt{17})^2$ $1+16=17$ $17=17$ Yes $a^2+b^2=c^2$
What is the length of the unknown side that would make this a right triangle?  $a^2+(5\sqrt{2})^2=(3\sqrt{11})^2$ $a^2+50=99$ $-50\ \ -50$ $a^2=49$ $a=7$	What is the length of the unknown side that would make this a right triangle?  $\sqrt{162}=9\sqrt{2}$
Is the triangle with lengths of 9 feet, 9 feet, and $\sqrt{175}$ a right triangle? Why? Why not?  $9^2+9^2\stackrel{?}{=}(\sqrt{175})^2$ $81+81=175$ $162\neq175$ No. Because $a^2+b^2\neq175$	Is the triangle with lengths of 2 centimeters, 6 centimeters, and $3\sqrt{5}$ centimeters a right triangle? Why or why not? $2^2+6^2\stackrel{?}{=}(3\sqrt{5})^2$ $4+36\neq45$ No! Because $a^2+b^2\neq c^2$

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Independent Practice:

Problem Set for Independent Practice?? Students DO have to approximate to tenths place!!

Closure:

Give exit ticket for lesson 16 module 7 grade 8

Notes:

Lesson maps to Lesson 16, Grade 8, Module 7