Name: _____ Math _____, Period _____

Mr. Rogove Date: _____

Learning Objective: We will apply the Pythagorean Theorem to real world and math problems. (G8M7L12)

Concept Development:

Triangle Refreshers:

Pythagorean Theorem: In a right triangle, the sum of the squares of the legs is equal to the square of the hypotenuse. This is noted by the equation $a^2 + b^2 = c^2$ where a and b are legs, and c is the hypotenuse.

Area of a triangle: the area of a triangle is $\frac{1}{2} base \times height$.

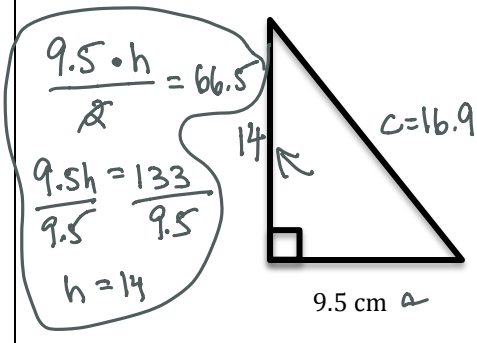
The **perimeter** of a triangle is the sum of the lengths of the three sides.

Guided Practice:

Steps for Solving Problems Using the Pythagorean Theorem

1. Read the problem carefully and identify the given information and the missing information.
2. If necessary/helpful, draw a picture.
3. Set up an equation to help you find the missing information.
4. Solve your equation and interpret the answer in the context of the problem.

The area of the right triangle below is 66.5 cm^2. Find the height and the perimeter. to nearest tenth.



$\frac{9.5 \cdot h}{2} = 66.5$

$\frac{9.5h}{9.5} = \frac{133}{9.5}$

$h = 14$

$(9.5)^2 + 14^2 = c^2$

$90.25 + 196 = c^2$

$286.25 = c^2$

$\sqrt{256}$ $c = \sqrt{286.25}$ $\sqrt{289}$

16.9 17.0

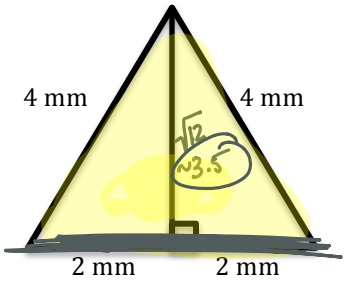
16.9 × 16.9 = 285.61

16.9² = 285.61

9.5 + 14 + 16.9 = 40.4

40.4cm

The equilateral triangle below has a side length of 4 mm. Find the height of the triangle and the area. nearest tenth.



$A = \frac{1}{2} \cdot 4 \cdot \sqrt{12}$

$= 2\sqrt{12}$

$= \sqrt{48}$

$A \approx 6.9$ sq. mm

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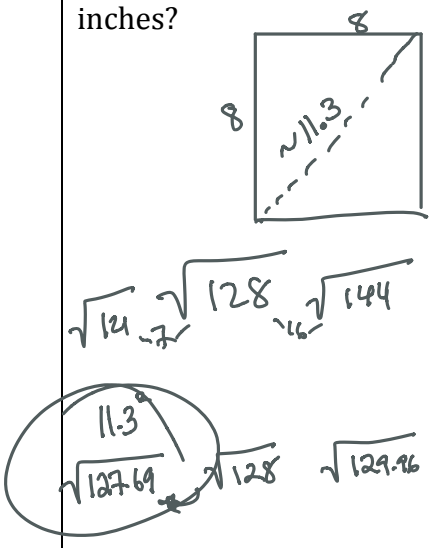
Many televisions (and other devices that have screens) have ratios of length to width of 4:3. For example, a phone that has a length of 4 inches and a width of 3 inches has a diagonal length of 5 inches (because $4^2 + 3^2 = 5^2$). When we talk about the size of devices with screens, it is the diagonal length we are talking about.

How big is a tablet screen that has a length of 8 inches and a width of 8 inches?



How big is a TV that has a length of 38 inches and a width of 28.5 inches (assume a 4:3 ratio)?

$38^2 + 28.5^2 = c^2$

$(4x)^2 + (3x)^2 = (5x)^2$

$x = 9.5$

$c = 47.5$

The TV at the front of the room also has a 4:3 ratio. Our tech folks told me it is a 75 inch TV. What is the length and width of the TV?

The iPhone 6Plus also has a 4:3 ratio is billed as having a 5.5 inch screen. What is the length and width of the screen?

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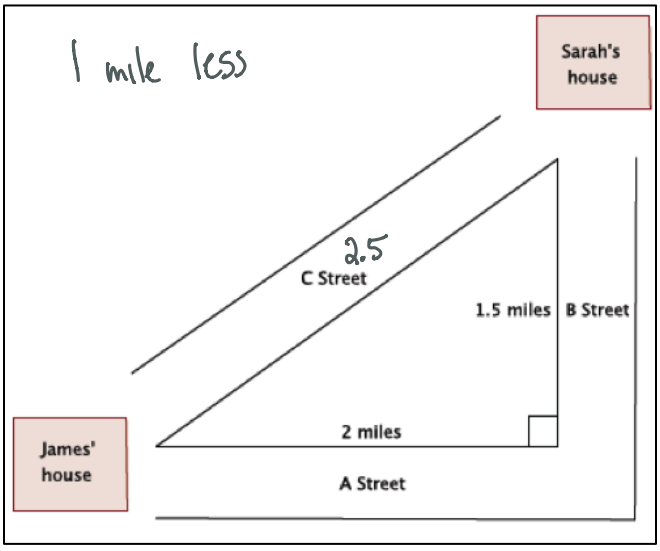
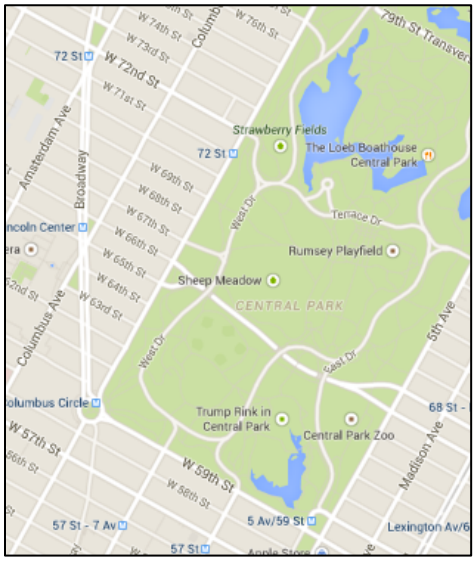
There are two ways to get from James' house to Sarah's house. How long is each route? How much shorter is the diagonal C Street route?



In Manhattan, Broadway runs diagonally on the upper west side. In order to get from Lincoln Center to Columbus Square, you can either take Columbus Avenue from 66th Street South to 59th Street (this is 0.4 miles) and make a left and walk one block (0.3 miles) , or you can just take Broadway. How far is it if you just take Broadway?



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Independent Practice:

Maybe exercises from Lesson 18 (not the problem set, but exercises).

Activating Prior Knowledge:

Closure:

Lincoln Center Question can be closure.

Notes: This is from Lesson 18, Module 7, Grade 8