

NAME: _____

Math _____, Period _____

Mr. Rogove

Date: _____

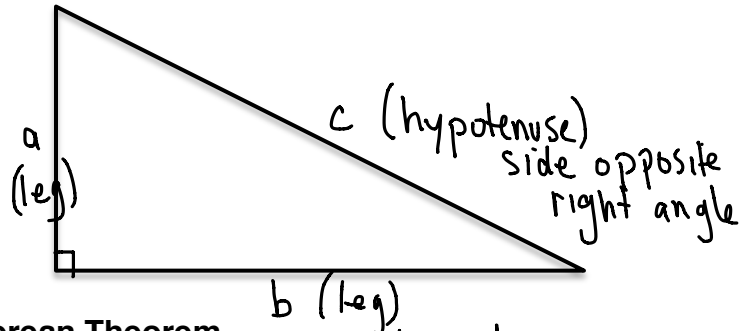
LEARNING OBJECTIVE: We will prove the Pythagorean Theorem to be $a^2 + b^2 = c^2$. (G8M2L12)



CONCEPT DEVELOPMENT:

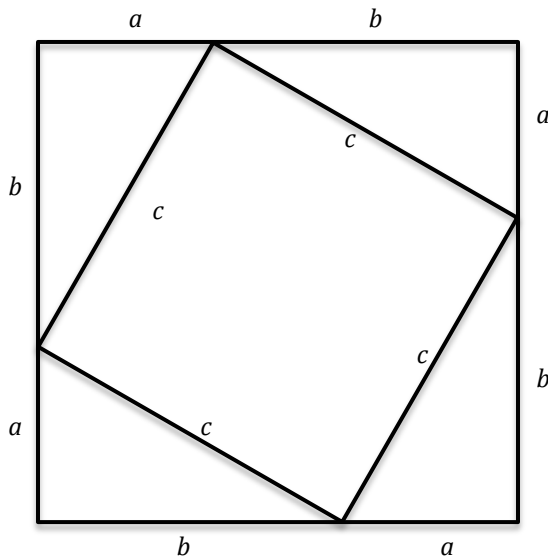
Pythagorean Theorem: If the lengths of the legs of a right triangle are a and b , and the length of the hypotenuse is c , then $a^2 + b^2 = c^2$.

Anatomy of a Right Triangle



Proving the Pythagorean Theorem

Sides adjacent right angle.

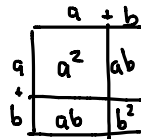


$$(a+b)^2 = c^2 + 4 \cdot \frac{1}{2}ab$$

$$(a+b)^2 = c^2 + 2ab$$

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

$$\begin{array}{r} -2ab \\ \hline a^2 + b^2 = c^2 \end{array}$$



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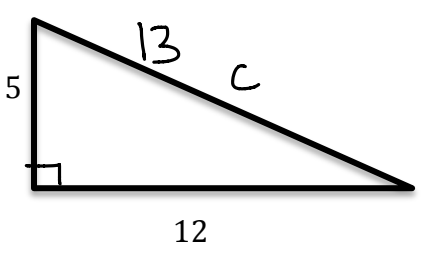
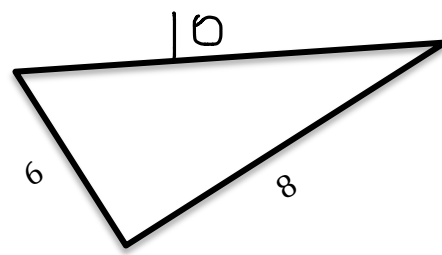
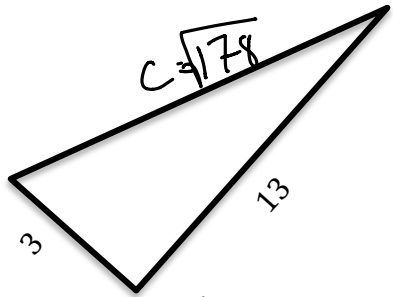
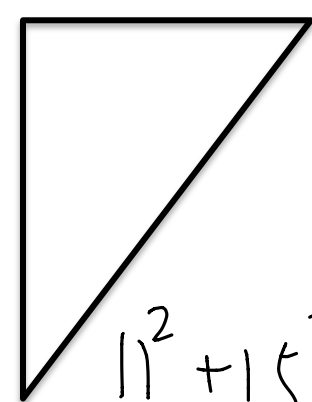
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GUIDED PRACTICE:

Steps for Finding the Length of the sides of a Right Triangle

1. Identify the length of the given sides of a right triangle.
2. Use the Pythagorean Theorem ($a^2 + b^2 = c^2$) to substitute the length of the given sides for a , b , or c .
3. Simplify and determine the length of the missing side.

Note: Triangles NOT drawn to scale!!

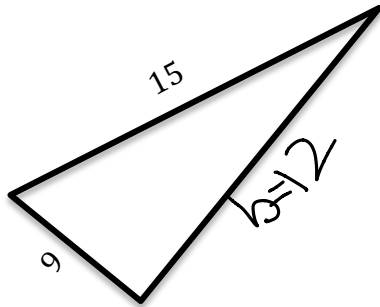
 <p>$5^2 + 12^2 = c^2$ $25 + 144 = c^2$ $\sqrt{169} = \sqrt{c^2}$ $13 = c$</p>	
 <p>$3^2 + 13^2 = c^2$ $9 + 169 = c^2$ $\sqrt{178} = \sqrt{c^2}$ $c = \sqrt{178}$</p>	 <p>$11^2 + 15^2 = c^2$ $121 + 225 = c^2$ $346 = c^2$ $\sqrt{346} = c$</p>

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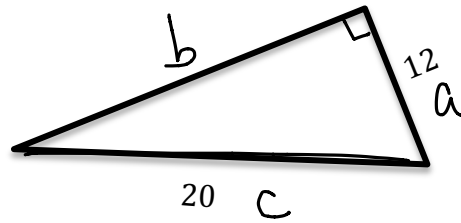
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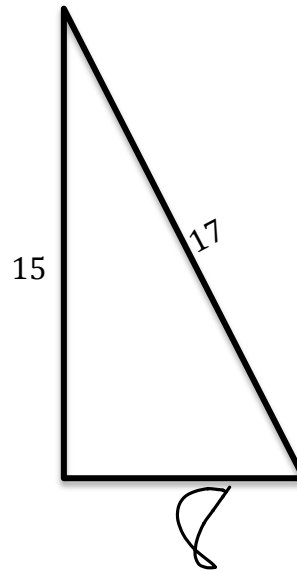
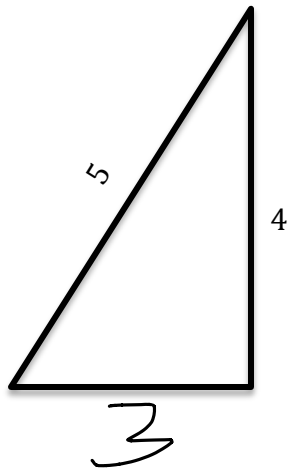
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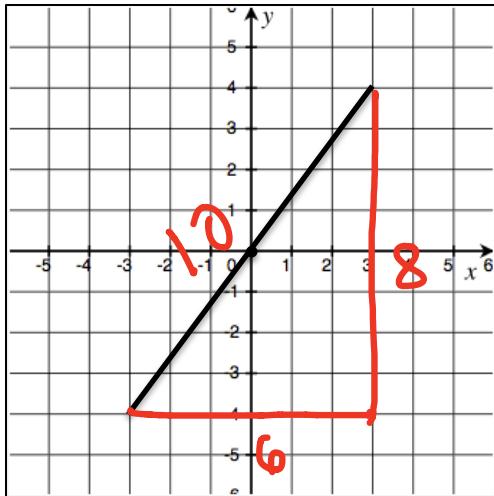


$$9^2 + 12^2 = 15^2$$
$$81 + 144 = 225$$
$$225 = 225$$



$$12^2 + b^2 = 20^2$$
$$144 + b^2 = 400$$
$$\begin{array}{r} -144 \\ b^2 = 256 \end{array}$$
$$\sqrt{b^2} = \sqrt{256} \quad \boxed{b=16}$$

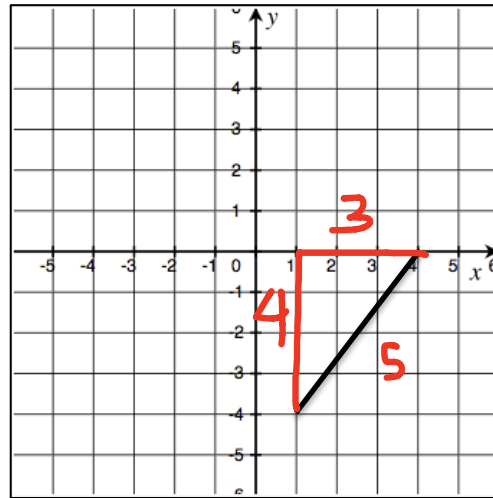




$$6^2 + 8^2 = c^2$$

$$36 + 64 = c^2$$

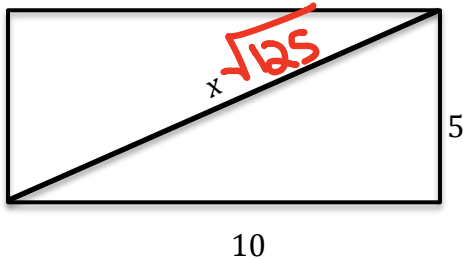
$$100 = c^2$$



$$3^2 + 4^2 = c^2$$

$$9 + 16 = 25$$

$$\sqrt{25} = 5$$



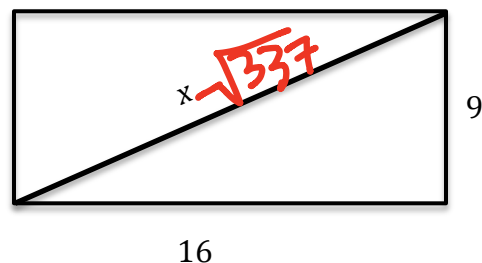
$$10^2 = 100$$

$$5^2 = 25$$

$$\underline{125}$$

$$x^2 = 125$$

$$x = \sqrt{125}$$



$$9^2 + 16^2 = x^2$$

$$81 + 256 = x^2$$

$$337 = x^2$$

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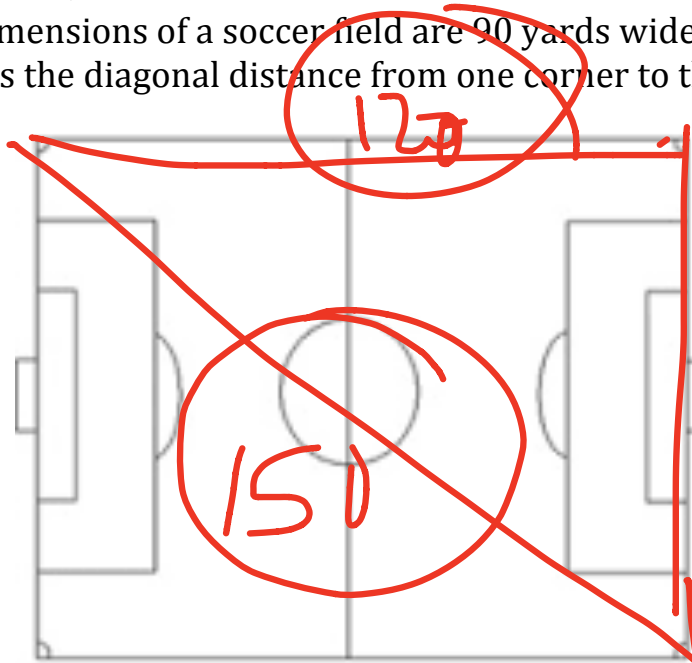
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INDEPENDENT PRACTICE:

ACTIVATING PRIOR KNOWLEDGE:

CLOSURE:

The dimensions of a soccer field are 90 yards wide by 120 yards long. What is the diagonal distance from one corner to the other?



~~90~~
 $90^2 + 120^2$

TEACHER NOTES:

Homework is going to be Problem set from lesson 15 and 16?

$8100 + 14400$
 $\hline 22500$