

Name: _____ Hour: _____ Date: _____

HONORS – Discovering the Patterns for Special Right Triangles

You may recall hearing or working with the *Pythagorean Theorem* in middle school...

What does the *Pythagorean Theorem* allow us to do?

find missing sides of
right triangles

Pythagorean Theorem:

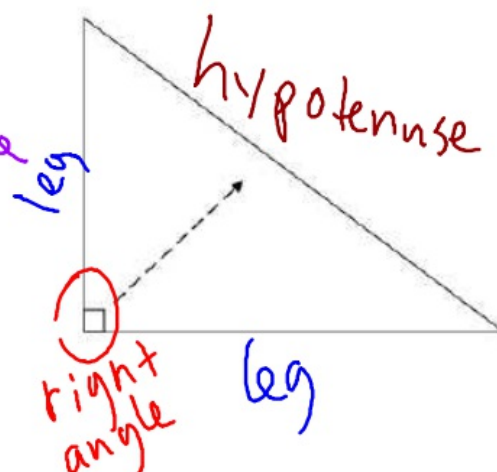
$$a^2 + b^2 = c^2$$

Recall the Parts of a Right Triangle:

- Right Angle: 90° angle
- Legs: Sides adjacent to the right angle
- Hypotenuse: longest side

- Side opposite of the right angle.

- longest side



Quick Review Problems

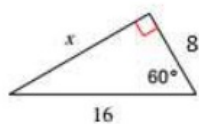
DIRECTIONS: Use the Pythagorean Formula to find the missing side of the right triangle.

$5^2 + 12^2 = c^2$
 $25 + 144 = c^2$
 $\sqrt{169} = \sqrt{c^2}$
 $13 = c$

$4^2 + b^2 = 5^2$
 $16 + b^2 = 25$
 $b^2 = 9$
 $b = 3$

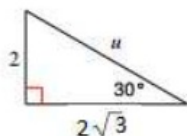
$10^2 + y^2 = 14^2$
 $100 + y^2 = 196$
 $y^2 = 96$
 $y = 4\sqrt{6}$

Use the Pythagorean Theorem to determine the missing side. Leave the answer in radical form! (SL=Short Leg, LL=Long Leg)



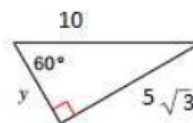
Work

$$\begin{aligned} \text{SL} &= 8 \\ \text{LL} &= 8\sqrt{3} \\ \text{H} &= 16 \end{aligned}$$



Work

$$\begin{aligned} \text{SL} &= 2 \\ \text{LL} &= 2\sqrt{3} \\ \text{H} &= 4 \end{aligned}$$



Work

$$\begin{aligned} \text{SL} &= 5 \\ \text{LL} &= 5\sqrt{3} \\ \text{H} &= 10 \end{aligned}$$

Using the answers for the triangles above, what relationships can you write using the sides of a special right triangle 30°-60°-90°

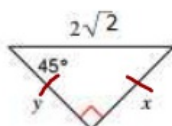
$$\begin{aligned} 2 \cdot \text{SL} &= \text{H} \\ \text{SL} \cdot \sqrt{3} &= \text{LL} \end{aligned}$$

Use Pythagorean Theorem to determine the missing side. Leave the answer in radical form.



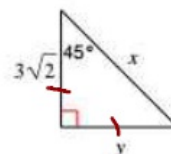
Work

$$\begin{aligned} \text{L} &= 6 \\ \text{L} &= 6 \\ \text{H} &= 6\sqrt{2} \end{aligned}$$



Work

$$\begin{aligned} \text{L} &= 2 \\ \text{L} &= 2 \\ \text{H} &= 2\sqrt{2} \end{aligned}$$



Work

$$\begin{aligned} \text{L} &= 3\sqrt{2} \\ \text{L} &= 3\sqrt{2} \\ \text{H} &= 6 \end{aligned}$$

Using the answers for the triangles above, what relationships can you write using the sides of a special right triangle 45°-45°-90°

$$\begin{aligned} \text{Legs are congruent} \\ \text{H} &= \text{L} \cdot \sqrt{2} \end{aligned}$$