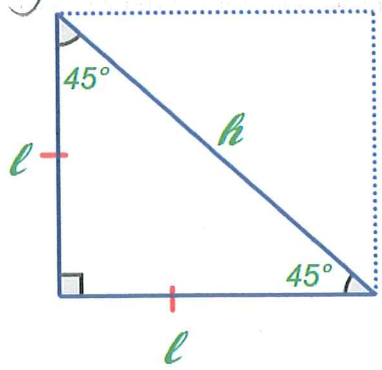
Name Key

Special Right Triangles- Notes!

Part 1: Exploring the 45°-45°-90° Triangle

Label the legs l and the hypotenuse h.



Length of Legs	Length of Hypotenuse
1	$\sqrt{2}$
2	$\sqrt{8} = 2\sqrt{2}$
3	$\sqrt{18} = 3\sqrt{2}$
4	$\sqrt{32} = 4\sqrt{2}$
5	$\sqrt{50} = 5\sqrt{2}$
6	$\sqrt{72} = 6\sqrt{2}$
7	$\sqrt{98} = 7\sqrt{2}$

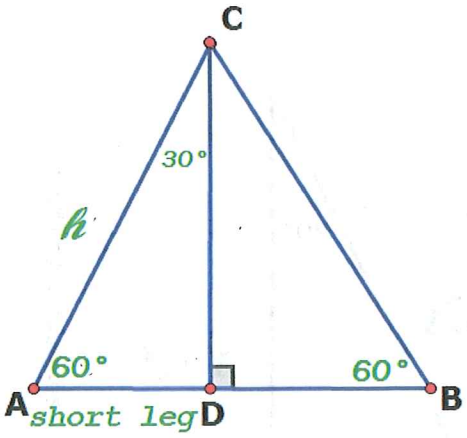
Isosceles Right Triangle Conjecture:

In an isosceles right triangle, if the legs have the length l, then the hypotenuse has length $l\sqrt{2}$.

Part 2: Exploring the 30°-60°-90° Triangle

Draw an equilateral triangle to the best of your ability. Label it ABC and draw altitude CD. (see below)

Answer the following questions. They will set up the investigation for you.



1. If you know you started with an equilateral triangle, what does that mean about all sides of the triangle?

   they are the same; $\cong$

2. Altitude CD creates two congruent triangles, by what congruent shortcut?

   SAA

3. What does altitude CD do to side AB?

   cuts it in half

4. How does the hypotenuse relate to the "short leg" in this triangle? Say h=6m what is the length of the short leg?

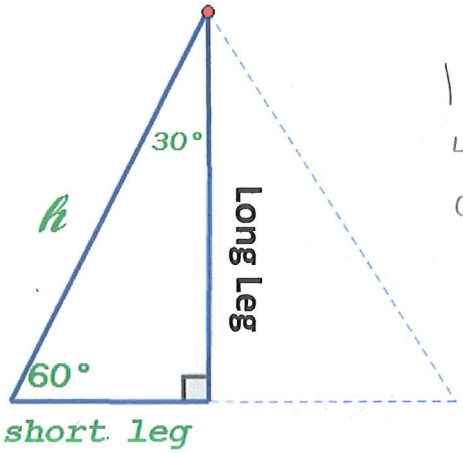
   hypotenuse is double the short leg. h=6 cm, short leg = 3cm

Review:

How do you know which leg is the shorter leg?

The leg with the 60° and 90° angles.

5. Sketch a 30°-60°-90° triangle below. Choose any integer for the length of the shorter leg. Use the relationship from questions #4 and the Pythagorean Theorem to find the length of the hypotenuse. Simplify the square root. Repeat this with several integer values for the shorter leg and fill out the chart below.



$1+x^2=4$

$4+x^2=16$

$9+x^2=36$

$16+x^2=64$

$25+x^2=100$

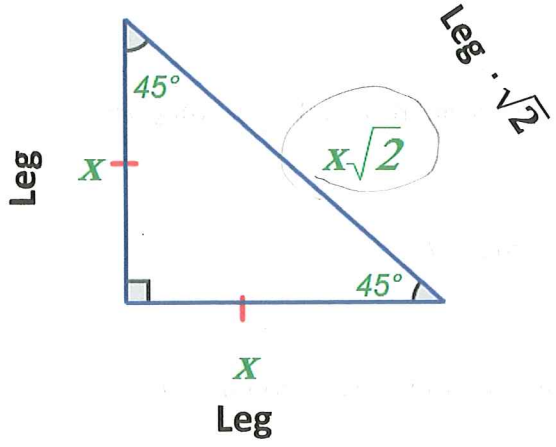
Shorter Leg	Hypotenuse	Longer Leg
1	1x2= 2	$\sqrt{3}$
2	$2*2=4$	$\sqrt{12}=2\sqrt{3}$
3	$3*2=6$	$\sqrt{27}=3\sqrt{3}$
4	$4*2=8$	$\sqrt{48}=4\sqrt{3}$
5	$5*2=10$	$\sqrt{75}=5\sqrt{3}$

30°-60°-90° Triangle Conjecture:

In an 30°-60°-90° triangle, if the shorter leg has length a, then the longer leg has length $a\sqrt{3}$ and the hypotenuse has length $2a$.

REVIEW: Special Right Triangles

45-45-90 isosceles right triangle



30-60-90 special right triangle