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## Special Right Triangles- Notes!

Part 1: Exploring the $45^{\circ}-45^{\circ}-90^{\circ}$ Triangle
Label the legs I and the hypotenuse $h$.

| Length of Legs | Length of Hypotenuse |
| :---: | :--- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |



## Isosceles Right Triangle Conjecture:

In an isosceles right triangle, if the legs have the length I, then the hypotenuse has length $\qquad$ .

## Part 2: <br> Exploring the $30^{\circ}-60^{\circ}-90^{\circ}$ Triangle

Draw an equilateral triangle to the best of your ability. Label it ABC and draw altitude CD.
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?
2. Altitude CD creates two congruent triangles, by what congruent shortcut?
3. What does altitude $C D$ do to side $A B$ ?
4. How does the hypotenuse relate to the "short leg" in this triangle? Say $h=6 \mathrm{~m}$ what is the length of the short leg?

Review:

How do you know which leg is the shorter leg?
5. Sketch a $30^{\circ}-60^{\circ}-90^{\circ}$ 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.


| Shorter Leg | Hypotenuse | Longer Leg |
| :--- | :--- | :--- |
| 1 | $1 \times 2=2$ |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |

$30^{\circ}-60^{\circ}-90^{\circ}$ Triangle Conjecture:
In an $30^{\circ}-60^{\circ}-90^{\circ}$ triangle, if the shorter leg has length a, then the longer leg has length
$\qquad$ and the hypotenuse has length $\qquad$ .

## REVIEW: Special Right Triangles

45-45-90 isosceles right triangle
30-60-90 special right triangle



X
Short Leg

