Special Right Triangles

Investigation 1, 45 – 45 – 90

1. Complete the table below. (Hint: Draw the right triangle, label what you know, use $a^2+b^2=c^2$).
   Make sure you simplify your radicals!

Length of each leg	1	2	3	4	5	6	7	10	X
Length of the hypotenuse	$\sqrt{2}$	$2\sqrt{2}$	$3\sqrt{2}$	$4\sqrt{2}$	$5\sqrt{2}$	$6\sqrt{2}$	$7\sqrt{2}$	$10\sqrt{2}$	$X\sqrt{2}$

2. Complete the conjecture below.

Isosceles Right Triangle Conjecture – In an isosceles right triangle, if the legs have length x, then the hypotenuse has length $X\sqrt{2}$.

Investigation 2, 30 – 60 – 90 Triangles

1. Draw an equilateral triangle ABC below. On the triangle provided, draw a perpendicular bisector through line segment AC and point B.
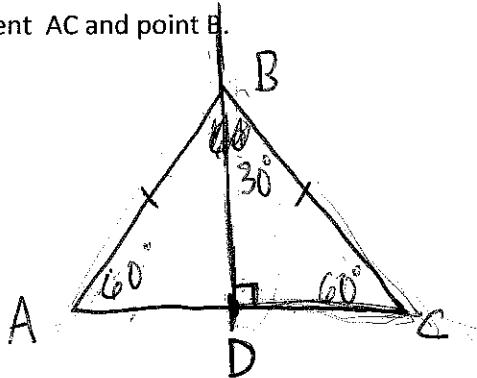
2. Label the intersection between the line you just drew and AC as point D. What type of triangle (based on the angles) is triangle BDC? __Right__ . Now, complete the statement below.

   In a 30-60-90 right triangle, the shortest leg is __half.__ the hypotenuse.

3. Complete the table below.

Length of shorter Leg	1	2	3	4	5	6	7	10	a
Length of hypotenuse	2	4	6	8	10	12	14	20	2a
Length of longer leg	$\sqrt{3}$	$2\sqrt{3}$	$3\sqrt{3}$	$4\sqrt{3}$	$5\sqrt{3}$	$6\sqrt{3}$	$7\sqrt{3}$	$10\sqrt{3}$	$9\sqrt{3}$

4. Complete the conjecture below.

30 – 60 – 90 Triangle Conjecture - In a 30 – 60 – 90 triangle, if the shorter leg has length a, then the longer leg has length $9\sqrt{3}$ and the hypotenuse has length $2a$?