1. The longest side of a right triangle is called the "hypotenuse". That word has been in use for thousands of years. The hypotenuse is always located across from the ___-degree angle.

2. The two shorter sides of a right triangle are called "legs". If the triangle is on a flat surface, then:
   a. The legs are _______er than the hypotenuse. (longer, shorter, cooler)
   b. The angle between the two legs is always ____ degrees.
   c. The sum of the other two angles is always _____ degrees.

3. Pythagorean theorem: Let "C" represent the length of the hypotenuse and let "A" and "B" represent the lengths of the legs: Then **C =** ___________ , in terms of A and B. Solving that equation for B, we get **B =** ___________, in terms of A and C. Show how that equation is used to calculate the length of the shortest leg of a right triangle if the longer leg is 4 feet long and the hypotenuse is 5 feet long.

4. If you split a square in half diagonally you get two isoceles right triangles.
   a. The angles in such a triangle are always ___degrees, ___ degrees, and ___ degrees.
   b. We say that such a triangle is "isosceles" because its two legs have ________ lengths.
   c. The length of the hypotenuse must be _______ times the length of a leg in this kind of triangle.
   d. The length of either leg must be _____ times the length of the hypotenuse.
   Give at least three significant digits.
   e. Does #4 contradict #2a or #3? ___ Have you checked 4c & 4d with a ruler? ___

5. If one side of a triangle is 3 units long, another side is 4 units, and the third side is 5 units long then we call it a "3-4-5" triangle. (The units could be feet, inches or meters; it doesn't matter.)
   a. Do all 3-4-5 triangles have the same angles, regardless of their size? ____
   b. The greatest angle in a 3-4-5 triangle is always ____ degrees; the smallest is always _____ deg. (These numbers can't be expressed exactly in decimal form, but rounding them off to the nearest tenth of a degree is usually acceptable. We often round off to the nearest degree, as in 5c.)
   c. If a right triangle has a 53-degree angle then the shortest side must be ___ times the length of the hypotenuse. The leg adjacent to the 53-degree angle must be ____ times as long as the other leg. (Simple fractions are appropriate here.) *Have you checked these answers?* ____

6. If you bisect one angle in an *equilateral* triangle you get two special right triangles.
   a. The angles in such a right triangle are always ___ degrees, ___ degrees, and ___ degrees.
   b. If a right triangle has a 60-degree angle then its short leg must be _____ times as long as the hypotenuse, and the longer leg must be ____ times the length of the hypotenuse. (Use #3. Use *decimal* form here, and keep at least three digits as in 4c & 4d.) *Does 6b contradict 2a or 3?* ____ *-Did you use a ruler and protractor to check your answers?* ___

7. If you stretch a triangle to make it 5 times wider *without altering its height* then its area will become ___ times greater. If you then stretch it again to make it 5 times *taller* (without altering its new width) then its area must increase *again* by a factor of ____. After completing those *two* changes you have a new triangle which is bigger than the original one.
   a. Is it geometrically similar to the original one? (Are its angles still the same?) ____
   b. The area of the new (bigger) triangle is ____ times the area of the original one.
   c. Increasing both the height and width of a triangle by a factor of "X" causes its area to increase by a factor of ____.
   d. Using 17d on RS II, we must conclude that for any set of similar triangles the area depends on width (or height) in a simple way: **Area must be proportional to _________ _______**ed.
   e. Explain how 7c does or does not agree with #6 and #9 on RS II.