Triangle Experiment Activity

Use the triangle draw program to experiment: http://lsquaredmath.us/triangleDraw/triangleDraw.swf

Let angle $A = 30°$ and side $b = 5$ units. Experiment with various values of side a and determine when you have no solutions, one solution, and two solutions for this SSA triangle. You may want to start off with $a = 2$, 2.3, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 7, etc. and then fine tune the values more as needed. I recommend that you put angle A in the lower left corner of your triangle with the unknown side (side c in this case) horizontal and side b going up.

Think about the following questions for a SSA triangle as you experiment:

How do you know when a SSA triangle has no solutions?
What happens if the two given sides are equal?
What happens if the given side across from the given angle is larger than than the other given side?
What happens if the given side across from the given angle equals the height of the triangle?

Fill in the following chart with all possible positive values of a.
A triangle with angle $A = 30°$ and side $b = 5$ units, will have (insert intervals)

i. no solutions for $a \in$ _____

ii. 1 solution for $a \in$ _____

iii. 2 solutions for $a \in$ _____

Next determine what has to happen to side a to get a solution if angle A is larger than 90° and side b still equals 5.

Now let's move on to the SSS case. Consider the lengths of the 3 sides. Under what conditions is there no solution? Discuss only the lengths of the sides. Do not discuss the angles.