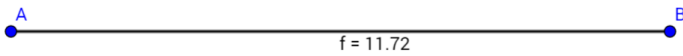


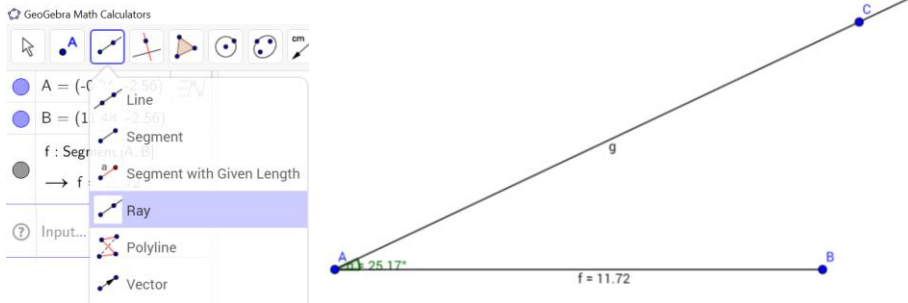
## Why is SSA Not a Congruence Relationship?

Use GeoGebra to explore what happens when attempting to construct a triangle given SSA

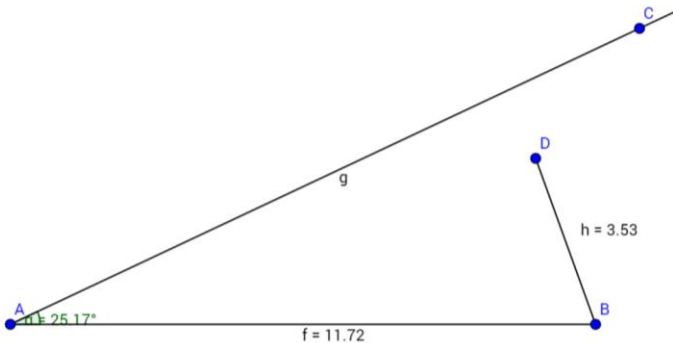
1. In GeoGebra, turn off the axes and grid.
2. Construct and measure segment AB.



3. With point A as the endpoint, construct a ray making an acute angle with segment AB. (Notice how I place point C almost off the screen.) Measure angle BAC.



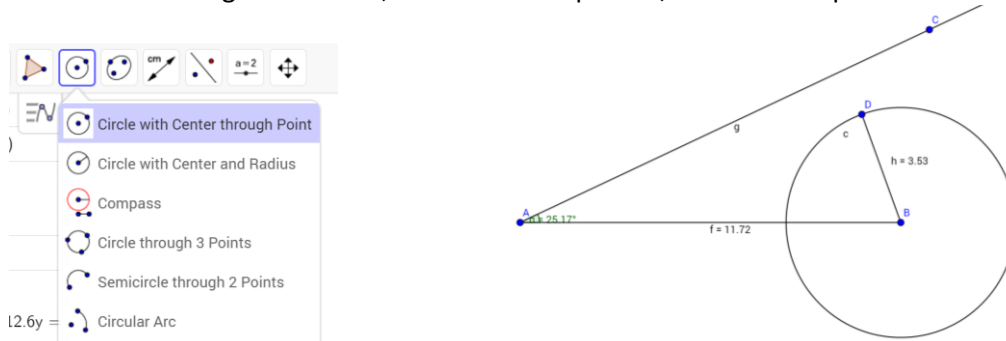
4. Construct segment BD. Segment BD should **not** intersect ray AC. Measure segment BD.



IMPORTANT: Notice you have constructed side BD, side AB, and angle A---attempting to construct a triangle given SSA!

5. **Exploration 1: Can a triangle be formed with the above dimensions?**

It doesn't look like it is possible, but be sure construct a circle with center point B and radius BD. Using the Circle with Center through Point tool., click on center point B, then click on point D to set the radius.



The distance from B to any point on the circle is the same as the length of BD. With the given two sides and non-included angle (SSA) is a triangle possible?

6. **Exploration 2:** Drag point D to change the length of segment BD.  
Find a SSA situation where two triangles are possible. Draw and label a diagram below.

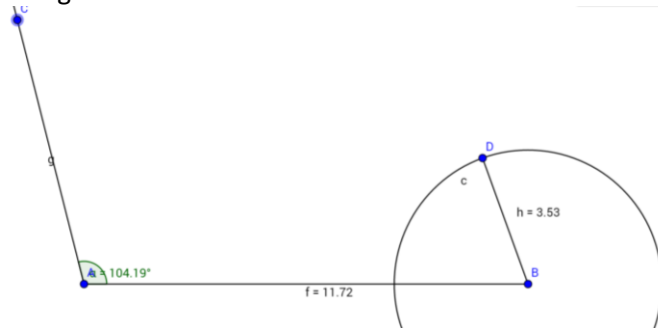
Find a SSA situation where exactly one triangle is possible. Draw and label a diagram below.

**Conclusion:**

Complete the statement

**SSA is not a triangle congruence relationship because**

7. Exploration 3: Drag point C so that angle BAC is an obtuse angle. Vary the length of BD and explore the possible triangles.



**Conclusion:**

In a given SSA relation with an obtuse triangle, how many triangles are possible? Why?

Does the result change if the given angle is a right angle?