

TRIANGLE CONGRUENCE POSSIBILITIES INVESTIGATION 1

Congruence Shortcuts

Investigation 1A – SSS

Log in to your Chromebook and navigate to www.geogebra.org. Click on “Start Creating” in the middle of the page; this should open a new window that says, “Create your own,” with options underneath it. Click on “Geometry.” www.geogebra.org

1. Use the segment tool to create a triangle $\triangle ABC$.
2. Using the Move tool, manipulate the triangle until the lengths of the sides are as follows:

$$\overline{AB} = 10, \overline{BC} = 14, \overline{AC} = 17$$

3. Create another triangle $\triangle DEF$ and make the side lengths the same as $\triangle ABC$.
4. Compare the triangles (remember: what do you need to compare to be *certain* of congruence?). Is it possible to construct different triangles from the same three parts, or will all of the triangles be congruent? Write your observations and conclusion in the space below.

Now, complete the conjecture below for the SSS case:

SSS Congruence Conjecture

If the three sides of one triangle are congruent to the three sides of another triangle, then_____.

Congruence Shortcuts

Investigation 1B – SAS

Log in to your Chromebook and navigate to www.geogebra.org. Click on “Start Creating” in the middle of the page; this should open a new window that says, “Create your own,” with options underneath it. Click on “Geometry.”

1. Use the tools to create two segments with the following lengths:

$$\overline{AB} = 11 \text{ and } \overline{AC} = 9$$

2. Using the Move tool, manipulate the segments until $m \angle A = 35^\circ$. Use the segment tool to complete $\triangle ABC$.
3. Create another triangle $\triangle DEF$ using the same restrictions used for $\triangle ABC$.
4. Compare the triangles (remember: what do you need to compare to be *certain* of congruence?). Is it possible to construct different triangles from the same three parts, or will all of the triangles be congruent? Write your observations and conclusion in the space below.

Now, complete the conjecture below for the SAS case:

SAS Congruence Conjecture

If two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, then _____.

Congruence Shortcuts

Investigation 1C – SSA

Log in to your Chromebook and navigate to www.geogebra.org. Click on “Start Creating” in the middle of the page; this should open a new window that says, “Create your own,” with options underneath it. Click on “Geometry.”

1. Use the tools to create two segments with the following lengths:

$$\overline{AB} = 8 \text{ and } \overline{BC} = 3$$

2. Use the segment tool to complete $\triangle ABC$. Using the Move tool, manipulate the segments until $m \angle A = 20^\circ$.
3. Create another triangle $\triangle DEF$ using the same restrictions used for $\triangle ABC$.
4. Compare the triangles. Remember: What do you need to compare to be *certain* of congruence? Is it possible to construct different triangles from the same three parts, or will all of the triangles be congruent? Write your observations and conclusion in the space below.

Now, complete the conjecture below for the SSA case:

SAS Congruence Conjecture

If two sides and a non-included angle of one triangle are congruent to two sides and a non-included angle of another triangle, then _____.