## Congruent, or Not?
**ID: 11136**

### Activity Overview
*In this activity, students will investigate whether AAA, SAS, or SSA relationship guarantee that two triangles are congruent or not. This is an exploratory activity where students will need to know how to change between pages, grab and move points, and measure lengths.*

### Topic: Rational Functions & Equations
- *SAS and ASA are relationships that prove congruence*

### Teacher Preparation and Notes
- *This activity was written to be explored with the TI-84 Plus family and the Cabri Jr. application.*
- *Students will need to load the three Cabri Jr. files on the graphing calculator before beginning the activity.*
- ***To download the Cabri Jr. files and student worksheet, go to education.ti.com/exchange and enter "11136" in the keyword search box.***

### Associated Materials
- *CongruentOrNot_Student.doc*
- *AAA.8xv*
- *SAS.8xv*
- *SSA.8xv*

### Suggested Related Activities
*To download any activity listed, go to education.ti.com/exchange and enter the number in the keyword search box.*
- *Congruent Triangles (TI-Nspire technology) — 8516*
- *Investigating Triangles and Congruence (TI-Nspire technology) — 8484*
- *The Hinge Theorems (TI-84 Plus family) — 7897*
- *SSA Ambiguity (TI-Nspire technology) — 9632*

**Problem 1 – Exploring the Angle-Angle-Angle Relationship**

Students should know the definition of included sides and angles. The students should also know the definition of congruent triangles. The students will explore properties of AAA, SAS, ASA, and SSA and determine if the given information is enough to prove congruence.
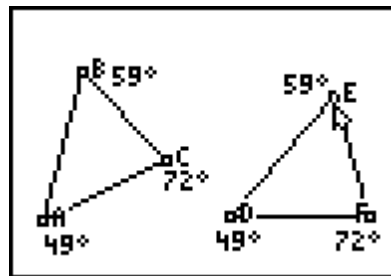
With the file **AAA** students will investigate the AAA relationship. Load the Cabri Jr. module using APPS, and open the AAA file by pressing Y=.

To measure the side lengths press GRAPH, select **Measure > D.&Length**, and click on the endpoints of the segment. To move any of the vertices of either triangle, move the cursor over a vertex and press ALPHA. A hand icon appears. Move the arrow keys to move the point and press ENTER to release the point.

Discussion Questions

- How do the angle measures of each triangle compare?

- How do the corresponding side lengths of each triangle compare?

- Does the AAA relationship guarantee that the two triangles are congruent? Explain.

**Problem 2 – Exploring the Side-Angle-Side Relationship**

With the file **SAS** students will investigate the SAS relationship. Students are given △*CAR* and angle *DPO*, with sides *PD* and *PO* congruent to sides *CB* and *CA*, respectively. Students should attempt to construct a triangle with vertices *P*, *O*, and *D* that is not congruent with △*CAR*.
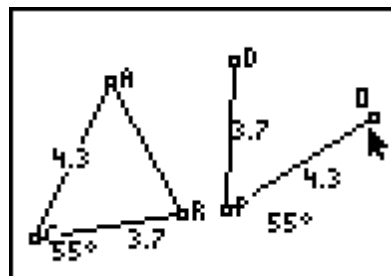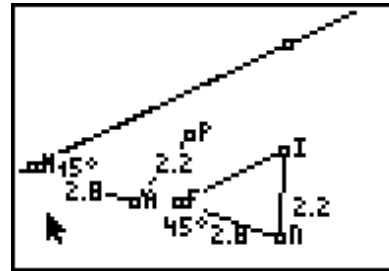
Discussion Questions

- Construct triangle *POD* and measure side *DO*. Can you vary the length of *DO* and still have the triangles congruent?

- Is there a triangle *POD* that is not congruent to triangle *ABC*? Explain.

**Problem 3 – Exploring the Side-Side-Angle Relationship**

In this activity students should first create a triangle congruent to △*FIN*. Then have students try to construct a triangle that is not congruent to △*FIN*. With the file **SSA** students will investigate the SSA relationship.



Discussion Questions

- Construct △*MAP* that is congruent to △*FIN*.

- Is it possible to manipulate △*MAP* so that it is not congruent to △*FIN*, while keeping the two measured sides and angle the same? Explain.