

Congruent, or Not?

ID: 11137

Time required

45 minutes

Activity Overview

In this activity, students will investigate whether AAA, SAS, ASA, or SSA relationships 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

- *The students can record their observations and answers completely on the TI-Nspire or use the accompanying student worksheet.*
- *Notes for using the TI-Nspire™ Navigator™ System are included throughout the activity. The use of the Navigator System is not necessary for completion of this activity.*
- ***To download the student TI-Nspire document (.tns file) and student worksheet, go to education.ti.com/exchange and enter “11137” in the keyword search box.***

Associated Materials

- *CongruentOrNot_Student.doc*
- *CongruentOrNot.tns*

Suggested Related Activities

To download any activity listed, go to education.ti.com/exchange and enter the number in the keyword search box.

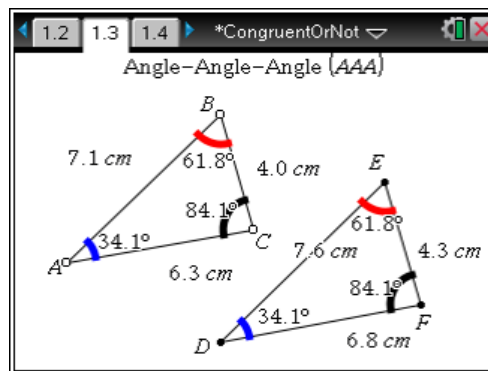
- *Congruent Triangles (TI-Nspire Technology) — 8516*
- *Investigating Triangles and Congruence (TI-Nspire Technology) — 8484*
- *The Hinge Theorems (TI-Nspire Technology) — 8853*

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.

Problem 1 – Exploring the Angle-Angle-Angle Relationship

On page 1.3 students will investigate the AAA relationship. Students should first measure the lengths of the sides of both triangles using the **Length tool (MENU > Measurement > Length)**. In order to measure only the side of the triangles, students should move their cursor over one of the sides, press **[tab]**, and then press **[enter]** twice.

The triangles appear to have almost the same side lengths. As they move points A, B, or C, students should observe the corresponding angles in $\triangle DEF$ move accordingly. The lengths of the sides of $\triangle DEF$ will change, showing students that the AAA relationship does not guarantee congruence.



Problem 1 Solution: No, you can create two triangles that are not congruent with the AAA relationship.

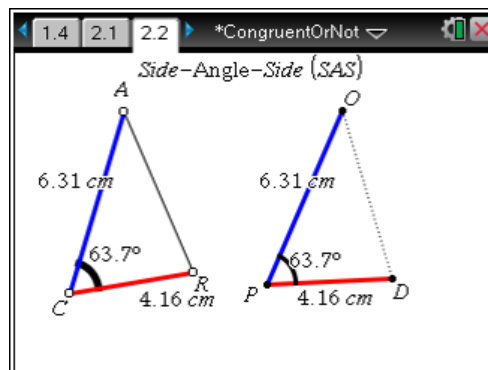
TI-Nspire Navigator Opportunity: Screen Capture

See Note 1 at the end of this lesson.

Problem 2 – Exploring the Side-Angle-Side Relationship

Students should try to make a triangle with vertices P, O, and D that is not congruent with $\triangle CAR$. They should see that it is impossible to make triangles CAR and POD not congruent.

If students are having trouble seeing this, they should draw segment OD. Then, they can measure the length of segment OD and measure angles O and D to see that all of the corresponding side lengths and angles are the same.



Problem 2 Solution: Yes, the SAS forces the segments into only one triangle that is congruent to $\triangle CAR$.

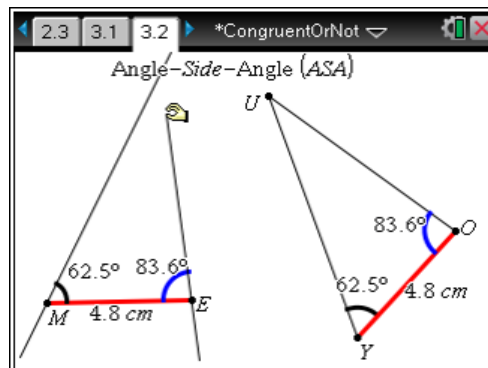
TI-Nspire Navigator Opportunity: Quick Poll

See Note 2 at the end of this lesson.

Problem 3 – Exploring the Angle-Side-Angle Relationship

Students should try to make a triangle with vertices M and E that is not congruent with $\triangle YOU$. Students can drag the end of lines M and E to extend the lines as shown to the right. Also, students can use the **Intersection Point(s)** tool (**MENU > Points & Lines > Intersection Point(s)**) to show where the lines will intersect to complete the triangle.

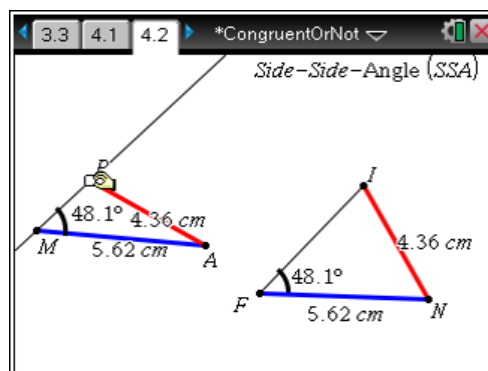
Problem 3 Solution: Yes, the segments are forced into one triangle that is congruent to $\triangle YOU$.



Problem 4 – Exploring the Side-Side-Angle Relationship

Students should try to create a triangle that is congruent to $\triangle FIN$. Encourage students to try to create a triangle that is not congruent to $\triangle FIN$. Students should find that there are two triangles that can be made with the given side lengths and angle measure.

Problem 4 Solution: No, the segments can make two different triangles with the SSA relationship.



TI-Nspire Navigator Opportunities

Note 1

Problem 1, Screen Capture

This would be a good place to do a screen capture to verify students are able to get the measurements of the sides for the two triangles.

Note 2

Problem 2, Quick Poll

You may choose to use Quick Poll to assess student understanding. The worksheet questions can be used as a guide for possible questions to ask.