Unit 1, Lesson 11

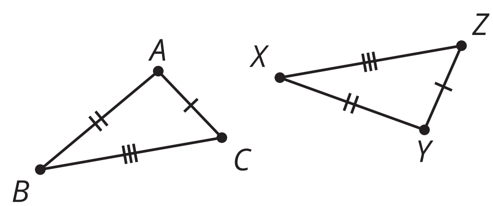
Are Those Triangles Congruent?

Let's identify congruent triangles and corresponding parts.

11.1 Corresponding Parts

Triangles ABC and YXZ are congruent.

$\overline{AC} \cong \overline{YZ}$, $\overline{AB} \cong \overline{YX}$, $\overline{BC} \cong \overline{XZ}$



1. Which triangle congruence theorem can you use to prove the triangles are congruent?

2. Name the 3 sets of corresponding sides.

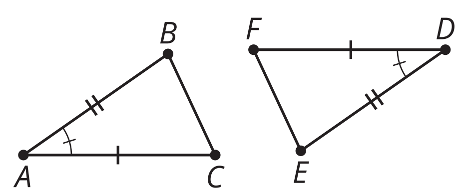
3. Name the 3 sets of corresponding angles.

11.2 Are We Congruent?

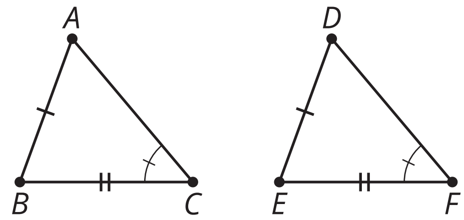
For each pair of triangles shown:

- Examine the images to identify all congruent parts in each triangle.
- Determine if there is enough information to prove the triangles are congruent.
- If the triangles are congruent, state which congruence theorem applies. If there is not enough information, state what additional information you need to prove the triangles are congruent.

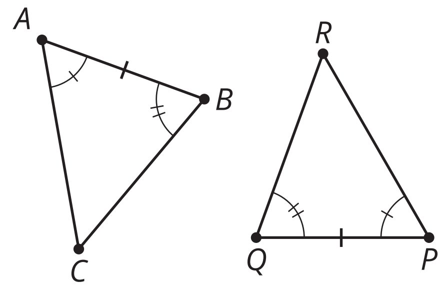
1. $\overline{AC} \cong \overline{DF}$, $\overline{AB} \cong \overline{DE}$, $\angle BAC \cong \angle EDF$



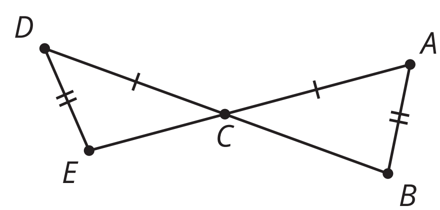
2. $\overline{AB} \cong \overline{DE}, \overline{BC} \cong \overline{EF}, \angle ACB \cong \angle DFE$



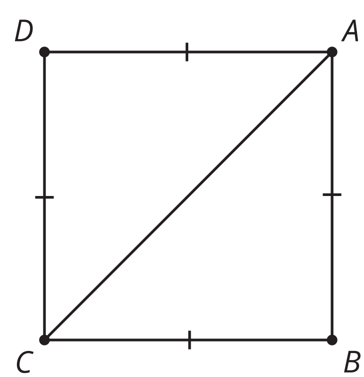
3. $\angle CAB \cong \angle RPQ, \overline{AB} \cong \overline{PQ}, \angle CBA \cong \angle RQP$



4. $\overline{DC} \cong \overline{AC}, \overline{DE} \cong \overline{AB}$

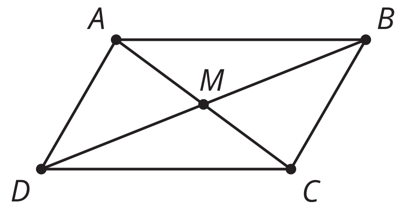


5. $\overline{AB} \cong \overline{BC} \cong \overline{CD} \cong \overline{DA}$



11.3 Prove It

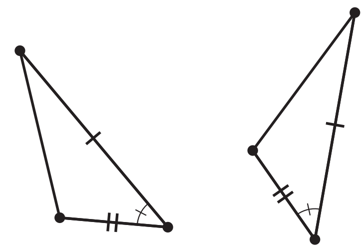
Here is parallelogram $ABCD$. Point M is the midpoint of diagonals AC and BD. Write an argument that shows triangle AMD is congruent to triangle CMB.



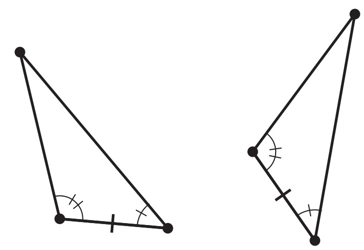
Lesson 11 Summary

To know whether two figures are congruent, we can show that there is a translation, rotation, or reflection, or a sequence of these rigid transformations, that takes the first figure exactly to the second figure. Alternatively, we could show that every pair of corresponding sides and angles are congruent. In a previous grade we learned some theorems that can help simplify this process for triangles.

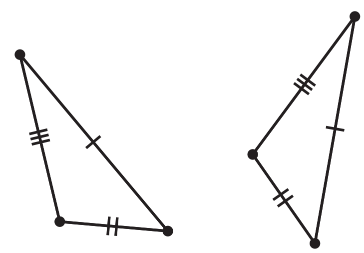
The *Side-Angle-Side Triangle Congruence Theorem* allows us to prove two triangles are congruent if two pairs of corresponding sides and the pair of corresponding angles between those sides are congruent.



The *Angle-Side-Angle Triangle Congruence Theorem* allows us to prove two triangles are congruent if two pairs of corresponding angles and a pair of corresponding sides are congruent. Because of the Triangle Angle Sum Theorem, given the measures of two angles in a triangle, we can always find the measure of the third angle, so this theorem works even if the congruent side is not between the two given angles.



The *Side-Side-Side Triangle Congruence Theorem* allows us to prove two triangles are congruent if all 3 pairs of corresponding sides are congruent.



To prove that two triangles are congruent, look at the diagram and given information and think about whether it will be easier to find pairs of corresponding angles that are congruent or pairs of corresponding sides that are congruent. Then check to see if all the information matches the Angle-Side-Angle, Side-Angle-Side, or Side-Side-Side Triangle Congruence Theorem.