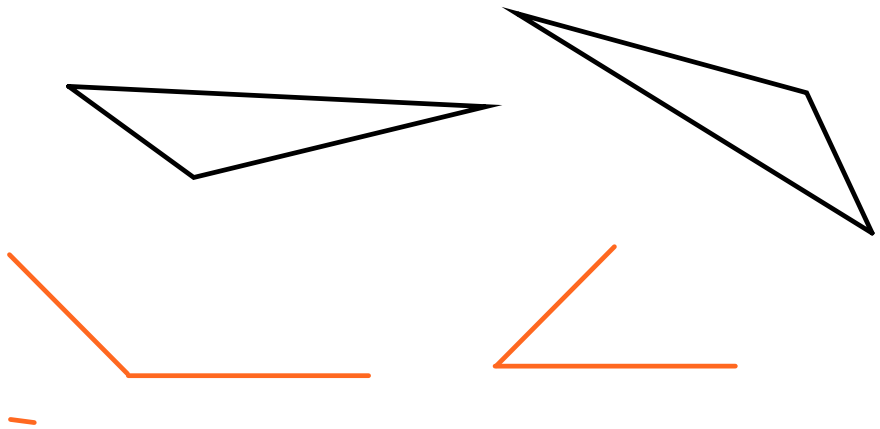
5.3: Proving Triangle Congruence by SAS

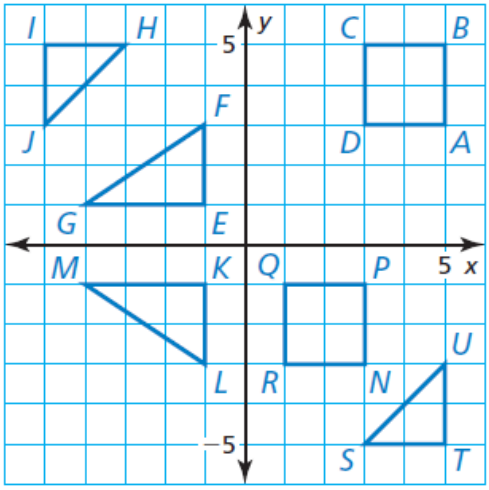
Essential Question

What can you conclude about two triangles when you know that two pairs of corresponding sides and the corresponding included angles are congruent?



Warmup

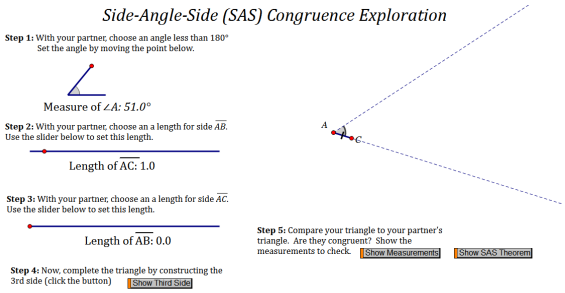
Write a congruence statement for each pair of congruent figures.



Congruence Exploration

1. Go to your lesson 5.3 on your GP Geometry page

2. Open the SAS Triangle congruence Exploration

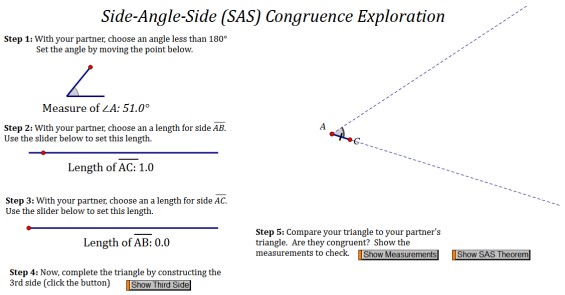


If two sides of a triangle and the angle between them are congruent.... are the triangles congruent?

Congruence Exploration

1. Go to your lesson 5.3 on your GP Geometry page

2. Open the SSA? Triangle congruence Exploration



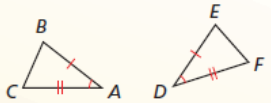
If two sides of a triangle and the angle NOT between them are congruent.... are the triangles congruent?

Theorem

Theorem 5.5 Side-Angle-Side (SAS) Congruence Theorem

If two sides and the included angle of one triangle are congruent to two sides and the included angle of a second triangle, then the two triangles are congruent.

If $\overline{AB} \cong \overline{DE}$, $\angle A \cong \angle D$, and $\overline{AC} \cong \overline{DF}$, then $\triangle ABC \cong \triangle DEF$.

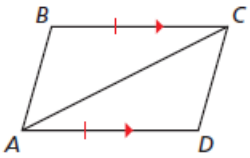


Proof p. 246

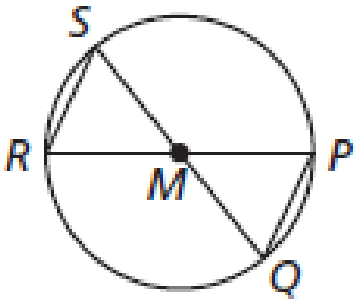
Example: Write a proof.

Given $\overline{BC} \cong \overline{DA}$, $\overline{BC} \parallel \overline{AD}$

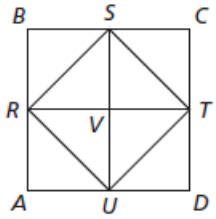
Prove $\triangle ABC \cong \triangle CDA$



In the diagram, $\overline{QS}$ and $\overline{RP}$ pass through the center *M* of the circle. What can you conclude about $\triangle MRS$ and $\triangle MPQ$?



In the diagram, *ABCD* is a square with four congruent sides and four right angles. *R*, *S*, *T*, and *U* are the midpoints of the sides of *ABCD*. Also, $\overline{RT} \perp \overline{SU}$ and $\overline{SV} \cong \overline{VU}$.



1. Prove that $\triangle SVR \cong \triangle UVR$.

2. Prove that $\triangle BSR \cong \triangle DUT$.

You are making a canvas sign to hang on the triangular portion of the barn wall shown in the picture. You think you can use two identical triangular sheets of canvas. You know that $\overline{RP} \perp \overline{QS}$ and $\overline{PQ} \cong \overline{PS}$. Use the SAS Congruence Theorem to show that $\triangle PQR \cong \triangle PSR$.