

5.6 ASA and AAS Triangle Congruence

Bellwork:

Determine which triangle congruence theorem, if any, can be used to prove the triangles are congruent.

1. SAS

2. NO

3. SAS

4. NO

Warm Up

Theorem

Theorem 5.10 Angle-Side-Angle (ASA) Congruence Theorem

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

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

Proof p. 270



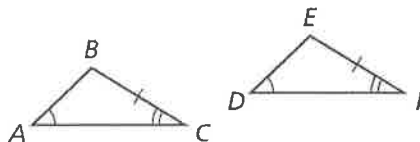
Theorem

Theorem 5.11 Angle-Angle-Side (AAS) Congruence Theorem

If two angles and a non-included side of one triangle are congruent to two angles and the corresponding non-included side of a second triangle, then the two triangles are congruent.

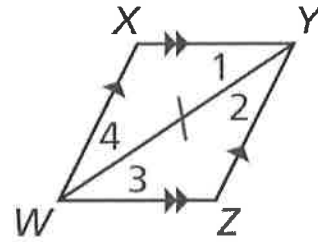
If $\angle A \cong \angle D$, $\angle C \cong \angle F$,
and $\overline{BC} \cong \overline{EF}$, then
 $\triangle ABC \cong \triangle DEF$.

Proof p. 271



Essential Question

1. Can the triangles be proven congruent with the information given in the diagram? If so, state the theorem you would use.

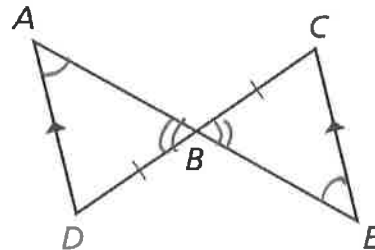


$\overline{WY} \cong \overline{WY}$ Reflexive POC
 $\angle 4 \cong \angle 2$ Alt. Int L's Thm
 $\angle 1 \cong \angle 3$ Alt. Int L's Thm
 $\triangle WXY \cong \triangle YZW$ ASA

Monitoring Progress 1

Given $\overline{AD} \parallel \overline{EC}$, $\overline{BD} \cong \overline{BC}$

Prove $\triangle ABD \cong \triangle EBC$



S
 $\overline{AD} \parallel \overline{EC}$
 $\overline{BD} \cong \overline{BC}$
 $\angle A \cong \angle E$
 $\angle ABD \cong \angle CBE$
 $\triangle ABD \cong \triangle EBC$

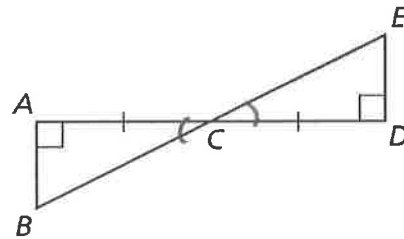
R
 Given
 Given
 Alt. Int L's Thm
 Vert. L's \cong Thm
 AAS

(This is one way, but there are other ways)

Example 2

Given: $\overline{AB} \perp \overline{AD}$, $\overline{DE} \perp \overline{AD}$, and $\overline{AC} \cong \overline{DC}$

Prove: $\triangle ABC \cong \triangle DEC$.



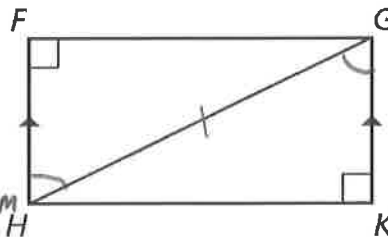
S
 $\overline{AB} \perp \overline{AD}$
 $\overline{DE} \perp \overline{AD}$
 $\overline{AC} \cong \overline{DC}$
 $\angle BAC$ and $\angle EDC$
 are right \angle 's
 $\angle BAC \cong \angle EDC$
 $\angle ACB \cong \angle ECD$
 $\triangle ABC \cong \triangle DEC$

R
 Given
 Given
 Given
 Def. of \perp
 Right $\angle \cong$ Thm
 Vert. $\angle \cong$ Thm
 ASA

Monitoring Progress 2

Given: $\overline{HF} \parallel \overline{GK}$, $\angle F$ and $\angle K$ are right angles.

Prove: $\triangle HFG \cong \triangle GKH$



S
 $\overline{HF} \parallel \overline{GK}$
 $\angle FHG \cong \angle KGH$
 $\angle F$ and $\angle K$ are
 right \angle 's
 $\angle F \cong \angle K$
 $\overline{HG} \cong \overline{HG}$
 $\triangle HFG \cong \triangle GKH$

R
 Given
 Alt. Int \angle 's Thm
 Given
 Right $\angle \cong$ Thm
 Reflexive POC
 AAS

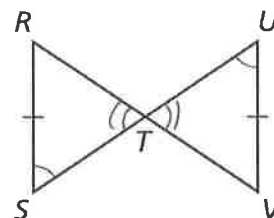
Example 3

Given: $\angle S \cong \angle U$ and $\overline{RS} \cong \overline{VU}$.

Prove: $\triangle RST \cong \triangle VUT$.

S
 $\angle S \cong \angle U$
 $\overline{RS} \cong \overline{VU}$
 $\angle RTS \cong \angle VTU$
 $\triangle RST \cong \triangle VUT$

R
 Given
 Given
 Vert. $\angle \cong$ Thm
 AAS



Monitoring Progress 3

Summary of Triangle Congruence Theorems:

SSS, SAS, HL, ASA, AAS

Homework:

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Closure