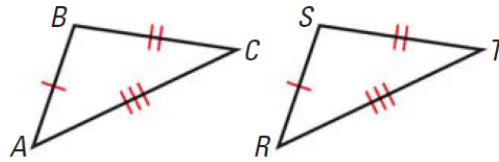


Unit 8.3 Prove Triangles Congruent by SSS NOTES

POSTULATE 19 Side-Side-Side (SSS) Congruence Postulate

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

If Side $\overline{AB} \cong \overline{RS}$,
 Side $\overline{BC} \cong \overline{ST}$, and
 Side $\overline{CA} \cong \overline{TR}$,
 then $\triangle ABC \cong \triangle RST$.



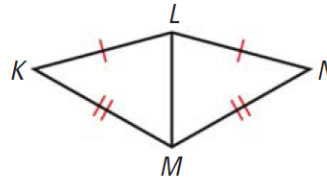
EXAMPLE 1 Use the SSS Congruence Postulate

Write a proof.

GIVEN $\triangleright \overline{KL} \cong \overline{NL}, \overline{KM} \cong \overline{NM}$

PROVE $\triangleright \triangle KLM \cong \triangle NLM$

Proof It is given that $\overline{KL} \cong \overline{NL}$ and $\overline{KM} \cong \overline{NM}$.
 By the Reflexive Property, $\overline{LM} \cong \overline{LM}$. So, by the
 SSS Congruence Postulate, $\triangle KLM \cong \triangle NLM$.

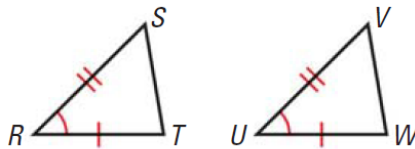


Unit 8.3 Prove Triangles Congruent by SAS NOTES

POSTULATE 20 Side-Angle-Side (SAS) Congruence Postulate

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 Side $\overline{RS} \cong \overline{UV}$,
 Angle $\angle R \cong \angle U$, and
 Side $\overline{RT} \cong \overline{UW}$,
 then $\triangle RST \cong \triangle UVW$.

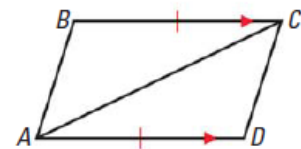


EXAMPLE 1 Use the SAS Congruence Postulate

Write a proof.

GIVEN $\triangleright \overline{BC} \cong \overline{DA}, \overline{BC} \parallel \overline{AD}$

PROVE $\triangleright \triangle ABC \cong \triangle CDA$



WRITE PROOFS

Make your proof easier to read by identifying the steps where you show congruent sides (S) and angles (A).

STATEMENTS

- S 1. $\overline{BC} \cong \overline{DA}$
 2. $\overline{BC} \parallel \overline{AD}$
 A 3. $\angle BCA \cong \angle DAC$
 S 4. $\overline{AC} \cong \overline{CA}$
 5. $\triangle ABC \cong \triangle CDA$

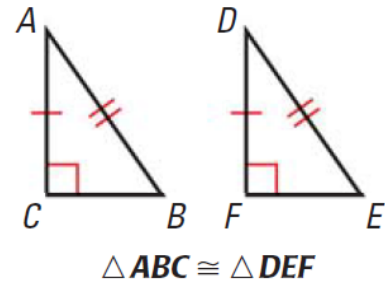
REASONS

1. Given
 2. Given
 3. Alternate Interior Angles Theorem
 4. Reflexive Property of Congruence
 5. SAS Congruence Postulate

Unit 8.3 Prove Triangles Congruent by HL NOTES

THEOREM 4.5 Hypotenuse-Leg (HL) Congruence Theorem

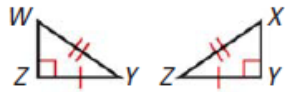
If the hypotenuse and a leg of a right triangle are congruent to the hypotenuse and a leg of a second right triangle, then the two triangles are congruent.



EXAMPLE 3 Use the Hypotenuse-Leg Congruence Theorem

USE DIAGRAMS

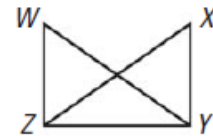
If you have trouble matching vertices to letters when you separate the overlapping triangles, leave the triangles in their original orientations.



Write a proof.

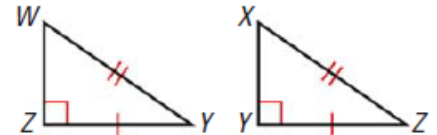
GIVEN $\triangleright \overline{WY} \cong \overline{XZ}, \overline{WZ} \perp \overline{ZY}, \overline{XY} \perp \overline{ZY}$

PROVE $\triangleright \triangle WYZ \cong \triangle XZY$



Solution

Redraw the triangles so they are side by side with corresponding parts in the same position. Mark the given information in the diagram.



STATEMENTS

- H** 1. $\overline{WY} \cong \overline{XZ}$
 2. $\overline{WZ} \perp \overline{ZY}, \overline{XY} \perp \overline{ZY}$
 3. $\angle Z$ and $\angle Y$ are right angles.
 4. $\triangle WYZ$ and $\triangle XZY$ are right triangles.
L 5. $\overline{ZY} \cong \overline{ZY}$
 6. $\triangle WYZ \cong \triangle XZY$

REASONS

1. Given
 2. Given
 3. Definition of \perp lines
 4. Definition of a right triangle
 5. Reflexive Property of Congruence
 6. HL Congruence Theorem