

4.9 Prove Triangles Congruent by SAS and HL

pp. 259 – 261



VOCABULARY

Leg of a right triangle **In a right triangle, a side adjacent to the right angle.**

Hypotenuse **In a right triangle, a side opposite the right angle.**

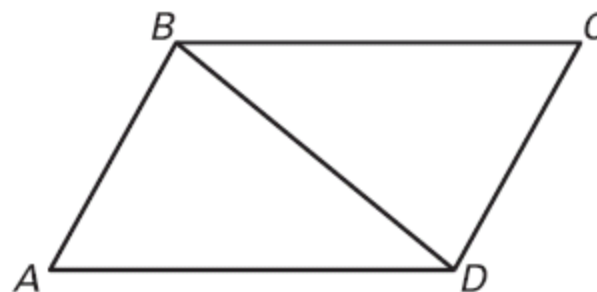


Use the diagram to name the included angle between the given pair of sides.

\overline{AB} and \overline{BC}

\overline{AB} and \overline{BD}

\overline{DA} and \overline{AB}



SIDE-ANGLE-SIDE (SAS) CONGRUENCE POSTULATE

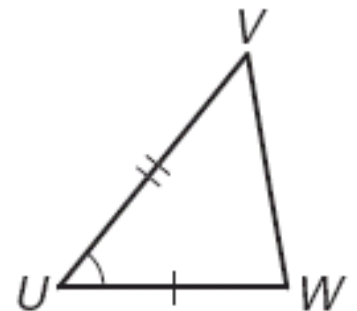
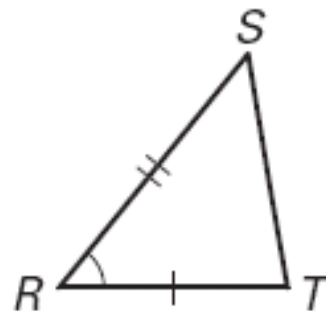
If two sides and the included angle of one triangle are congruent to two sides and the included angle of a second triangle, then the two triangles are congruent.

If Side $\overline{RS} \cong$ _____,

Angle $\angle R \cong$ _____, and

Side $\overline{RT} \cong$ _____,

then $\triangle RST \cong$ _____.



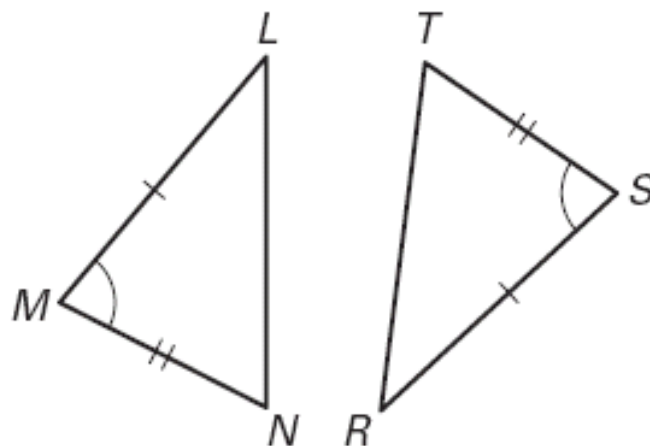
Example 1**Use the SAS Congruence Postulate**

Show that $\triangle LMN \cong \triangle RST$.

Solution

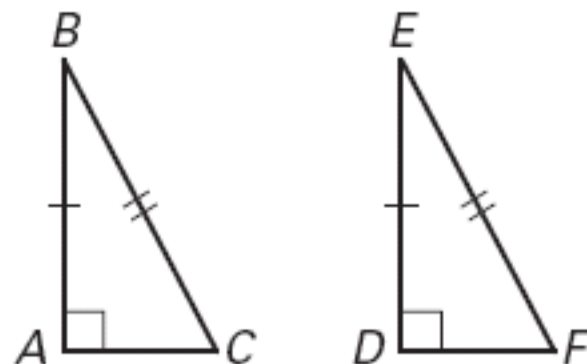
It is given that $\overline{LM} \cong \overline{RS}$,
 $\overline{MN} \cong \overline{ST}$, and _____ \cong _____.

So, by the _____
_____, $\triangle LMN \cong$ _____.



THEOREM 4.12: HYPOTENUSE-LEG 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 _____.



Example 2**Use the Hypotenuse-Leg Congruence Theorem**

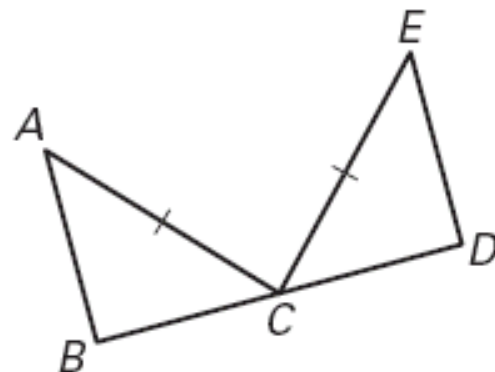
Write a proof.

Given $\overline{AC} \cong \overline{EC}$,

$\overline{AB} \perp \overline{BD}$,

$\overline{ED} \perp \overline{BD}$,

\overline{AC} is a bisector of \overline{BD} .



Prove $\triangle ABC \cong \triangle EDC$

Statements

Reasons

1. $\overline{AC} \cong \overline{EC}$

1. _____

2. $\overline{AB} \perp \overline{BD}$,

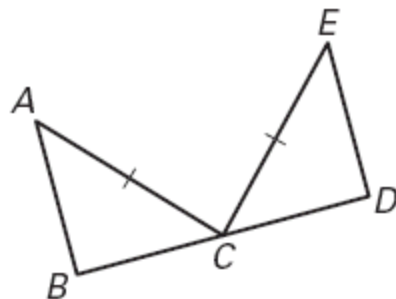
2. _____

$\overline{ED} \perp \overline{BD}$



Write a proof.

Given $\overline{AC} \cong \overline{EC}$,
 $\overline{AB} \perp \overline{BD}$,
 $\overline{ED} \perp \overline{BD}$,
 \overline{AC} is a bisector of \overline{BD} .



Prove $\triangle ABC \cong \triangle EDC$

3. $\angle B$ and $\angle D$ are

_____.

4. $\triangle ABC$ and $\triangle EDC$ are

_____.

5. \overline{AC} is a bisector
of \overline{BD} .

6. $\overline{BC} \cong \overline{DC}$

7. $\triangle ABC \cong \triangle EDC$

3. Definition of \perp lines

4. Definition of a _____

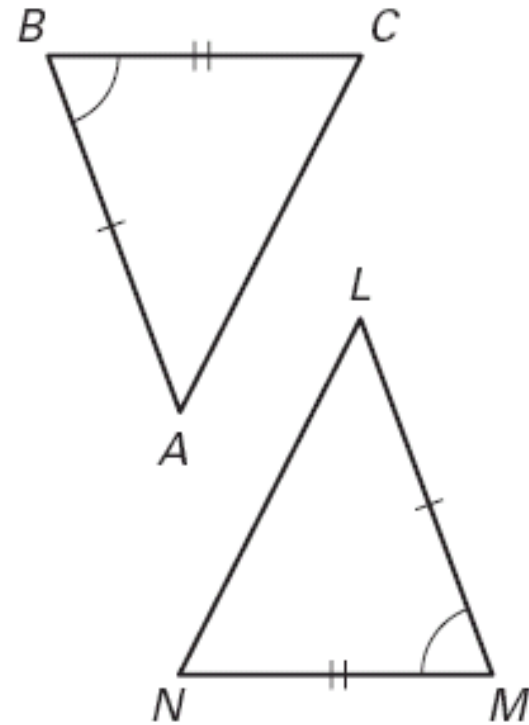
5. _____

6. Definition of segment
bisector

7. _____



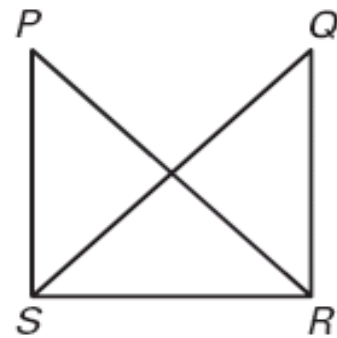
1. Decide whether enough information is given to prove that $\triangle ABC \cong \triangle LMN$ using the SAS Congruence Postulate.



2. Write a proof.

Given $\overline{PR} \cong \overline{QS}$, $\overline{PS} \perp \overline{SR}$, $\overline{QR} \perp \overline{SR}$

Prove $\triangle PRS \cong \triangle QSR$



Statements	Reasons
1. $\overline{PR} \cong \overline{QS}$	1. _____
2. $\overline{PS} \perp \overline{SR}$, $\overline{QR} \perp \overline{SR}$	2. _____
3. $\angle S$ and $\angle R$ are right angles.	3. _____
4. $\triangle PRS$ and $\triangle QSR$ are right triangles.	4. _____ _____
5. $\overline{SR} \cong \overline{RS}$	5. _____ _____
6. $\triangle PRS \cong \triangle QSR$	6. _____ _____

