

5.2 Prove Triangles Congruent by SSS, SAS, and HL

SIDE-SIDE-SIDE Congruence Postulate (SSS)

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



If Side $\overline{AB} \cong$ _____
 Side $\overline{BC} \cong$ _____
 Side $\overline{CA} \cong$ _____
 Then _____ \cong _____

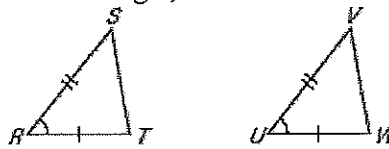
Example 1: Use SSS Congruence Postulate

<p>1. Given: $\overline{FJ} \cong \overline{HJ}$; G is the midpoint of \overline{FH} Prove: $\triangle FGJ \cong \triangle HGJ$</p>	<p style="text-align: center;">Statements</p> <p>1. $\overline{FJ} \cong \overline{HJ}$; G is the midpoint of \overline{FH}</p>	<p style="text-align: center;">Reasons</p> <p>1.</p>
<p>2. Given: $\overline{AB} \cong \overline{DC}$; $\overline{AC} \cong \overline{DB}$ Prove: $\triangle ABC \cong \triangle DCB$</p> <p style="border: 1px dashed black; border-radius: 10px; padding: 5px; width: fit-content; margin: 10px auto;">When \triangle's overlap, look for</p>	<p style="text-align: center;">Statements</p> <p>1.</p>	<p style="text-align: center;">Reasons</p> <p>1.</p>

SIDE-ANGLE-SIDE Congruence Theorem (SAS)

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.

The angle must be right in between the two sides!

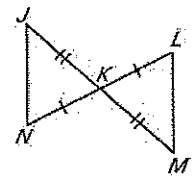
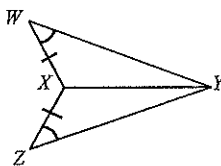
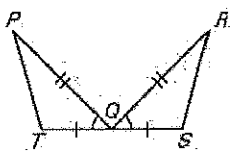


If Side $\overline{RS} \cong$ _____
 Angle $\angle R \cong$ _____
 Side $\overline{RT} \cong$ _____,
 Then _____ \cong _____

Example 2: SAS vs. Potty Mouth

Decide whether enough information is given to prove that the triangles are congruent using the SAS Congruence Postulate. Please state any theorems or postulates you use.

- a. True or False: $\triangle PQT \cong \triangle RQS$? b. True or False: $\triangle WXY \cong \triangle ZXY$? c. True or False: $\triangle NKJ \cong \triangle LKM$?



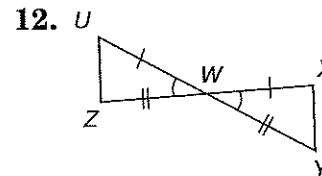
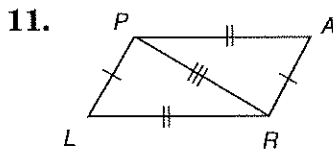
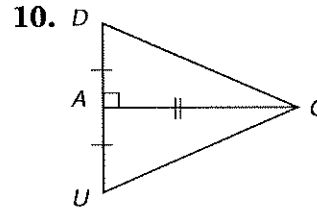
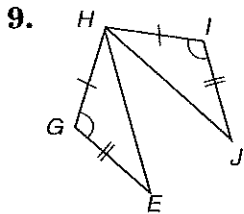
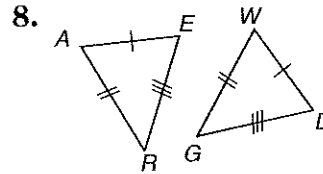
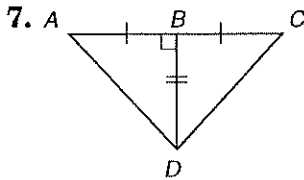
Skills Practice

SSS and SAS

Write a congruence statement for each pair of triangles represented.

1. $\overline{AC} \cong \overline{NO}$, $\overline{CL} \cong \overline{OP}$, $\angle C \cong \angle O$
2. $\overline{WX} \cong \overline{AB}$, $\overline{XZ} \cong \overline{BC}$, $\overline{WZ} \cong \overline{AC}$
3. $\overline{EG} \cong \overline{PS}$, $\overline{EH} \cong \overline{PT}$, $\angle E \cong \angle P$
4. $\overline{HY} \cong \overline{RP}$, $\overline{EY} \cong \overline{AP}$, $\angle Y \cong \angle P$
5. $\overline{ZA} \cong \overline{QR}$, $\overline{AP} \cong \overline{RS}$, $\overline{ZP} \cong \overline{QS}$
6. $\overline{ML} \cong \overline{ZN}$, $\overline{LR} \cong \overline{NB}$, $\angle L \cong \angle N$

Determine whether each pair of triangles is congruent. If so, write a congruence statement and explain why the triangles are congruent.



Use the given information to determine whether the two triangles are congruent by SAS. Write yes or no.

13. $\angle L \cong \angle M$, $\overline{LD} \cong \overline{MR}$, $\overline{LO} \cong \overline{MA}$
14. $\angle L \cong \angle M$, $\overline{LD} \cong \overline{MR}$, $\angle O \cong \angle A$,
15. $\overline{LD} \cong \overline{MR}$, $\overline{LO} \cong \overline{MA}$, $\angle O \cong \angle A$,
16. $\overline{LD} \cong \overline{MR}$, $\overline{LO} \cong \overline{MA}$, $\angle DO \cong \angle RA$

