Date: 12/14/20

Lesson 5.5 - SSS Triangle Congruency

Learning Intent (Target): *Today I will* be able to determine whether or not triangles are congruent based on Side-Side-Side Congruency.

Success Criteria: *I'll know I'll have it when* I can accuratley determine if triangles are congruent and write 2-column proofs using SSS Congruency for Triangles.

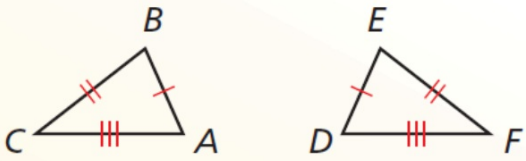
Accountable Team Task: *Therefore, I can* practice using interactive flip charts for notes and invstigations using gizmos & creating foldables.

Theorem

Theorem 5.8 Side-Side-Side (SSS) Congruence Theorem

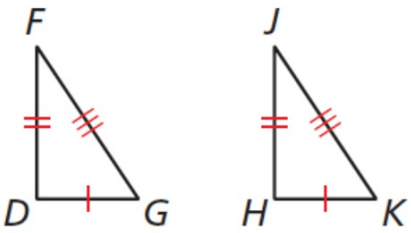
If three sides of one triangle are congruent to three sides of a second triangle, then the two triangles are congruent.

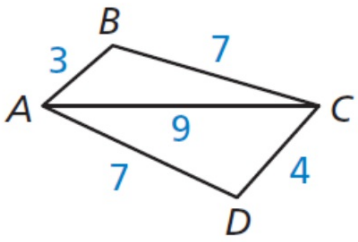
If $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, and $\overline{AC} \cong \overline{DF}$, then $\triangle ABC \cong \triangle DEF$.

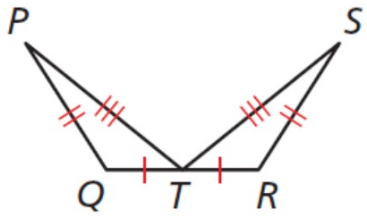


Decide whether the congruence statement is true. Explain your reasoning.

1. $\triangle DFG \cong \triangle HJK$ **2.** $\triangle ACB \cong \triangle CAD$ **3.** $\triangle QPT \cong \triangle RST$







yes; From the diagram markings, $\overline{DF} \cong \overline{HJ}$, $\overline{FG} \cong \overline{JK}$, and $\overline{DG} \cong \overline{HK}$. So, $\triangle DFG \cong \triangle HJK$ by the SSS Congruence Theorem (Thm. 5.8).

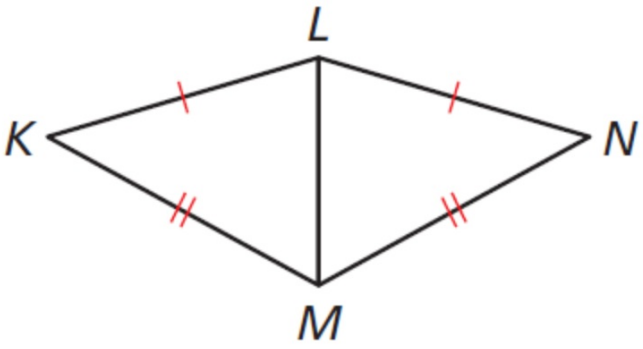
no; $\overline{AB}$ corresponds with $\overline{CD}$, but they are not the same measure. In order for two triangles to be congruent, all pairs of corresponding sides must be congruent.

yes; From the diagram markings, $\overline{QP} \cong \overline{RS}$, $\overline{PT} \cong \overline{ST}$, and $\overline{QT} \cong \overline{RT}$. So, $\triangle QPT \cong \triangle RST$ by the SSS Congruence Theorem (Thm. 5.8).

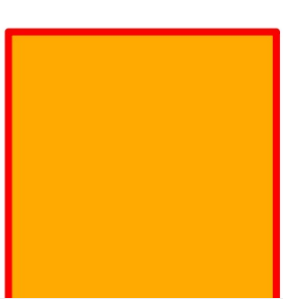
Write a proof.

Given $KL \cong NL$, $KM \cong NM$

Prove $\triangle KLM \cong \triangle NLM$



STATEMENTS	REASONS
S 1. $\overline{KL} \cong \overline{NL}$	1. Given
S 2. $\overline{KM} \cong \overline{NM}$	2. Given
S 3. $\overline{LM} \cong \overline{LM}$	3. Reflexive Property of Congruence (Thm. 2.1)
4. $\triangle KLM \cong \triangle NLM$	4. SSS Congruence Theorem

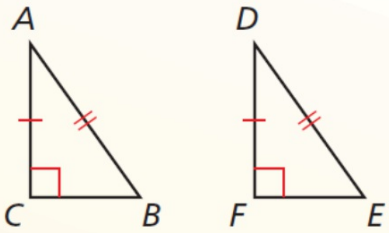


Theorem

Theorem 5.9 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.

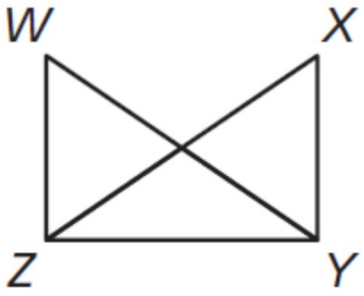
If $\overline{AB} \cong \overline{DE}$, $\overline{AC} \cong \overline{DF}$, and $m\angle C = m\angle F = 90°$, then $\triangle ABC \cong \triangle DEF$.



Proof Ex. 38, p. 470; *BigIdeasMath.com*

Write a proof.

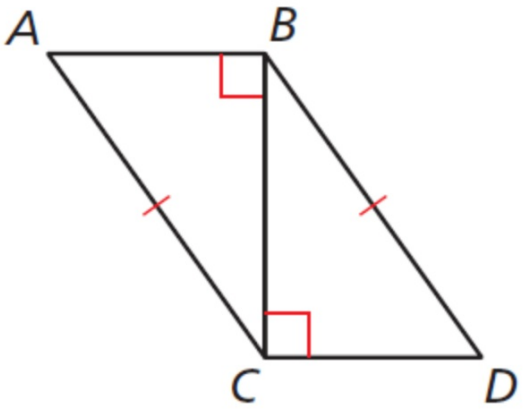
Given $WY \cong XZ$, $WZ \perp ZY$, $XY \perp ZY$
Prove $\triangle WYZ \cong \triangle XZY$



STATEMENTS	REASONS
H 1. $\overline{WY} \cong \overline{XZ}$	1. Given
2. $\overline{WZ} \perp \overline{ZY}, \overline{XY} \perp \overline{ZY}$	2. Given
3. $\angle Z$ and $\angle Y$ are right angles.	3. Definition of $\perp$ lines
4. $\triangle WYZ$ and $\triangle XZY$ are right triangles.	4. Definition of a right triangle
L 5. $\overline{ZY} \cong \overline{YZ}$	5. Reflexive Property of Congruence (Thm. 2.1)
6. $\triangle WYZ \cong \triangle XZY$	6. HL Congruence Theorem

Use the diagram.

7. Redraw $\triangle ABC$ and $\triangle DCB$ side by side with corresponding parts in the same position.



8. Use the information in the diagram to prove that $\triangle ABC \cong \triangle DCB$.

STATEMENTS	REASONS
1. $\overline{AC} \cong \overline{DB}$, $\angle ABC$ and $\angle DCB$ are right angles.	1. Given
2. $\overline{CB} \cong \overline{BC}$	2. Reflexive Property of Congruence (Thm. 2.1)
3. $\triangle ABC$ and $\triangle DCB$ are right triangles.	3. Definition of a right triangle
4. $\triangle ABC \cong \triangle DCB$	4. HL Congruence Theorem (Thm. 5.9)