Name: Key Date: _____ Period: _____

5.5 Proving Triangles Congruent by SSS & HL CYU

☑ *Use when you get it right all by yourself*

S *Use when you did it all by yourself, but made a silly mistake*

H *Use when you could do it alone with a little help from teacher or peer*

G *Use when you completed the problem in a group*

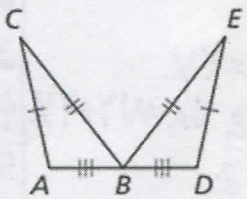
X *Use when a question was attempted but wrong (get help)*

N *Use when a question was not even attempted*

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
SSS Congruence Theorem	1, 2	5 - 7	11
HL Congruence Theorem	3, 4		11
Proofs	8	9	10
Solving Triangles			12

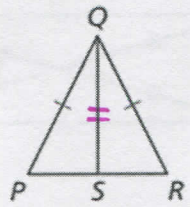
Decide whether enough information is given to prove that triangles are congruent using the SSS Theorem or HL Theorem. Explain.

1. ΔABC & ΔDBE



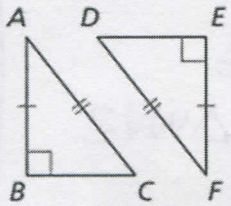
yes SSS
$\overline{AB} \cong \overline{BD}$
$\overline{AC} \cong \overline{DE}$
$\overline{BC} \cong \overline{BE}$

2. ΔPQS & ΔRQS



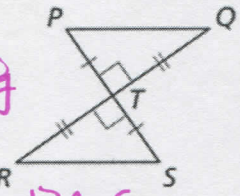
no, missing third side or Rt $\triangle$

3. ΔABC & ΔFED



yes; HL
$\angle B$ & $\angle E$ are Rt
$\overline{AB} \cong \overline{FE}$; $\overline{AC} \cong \overline{FD}$

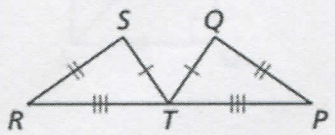
4. ΔPQT & ΔSRT



no, missing third side (hypotenuse) for both options
(SAS works)

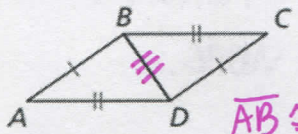
Decide whether the congruence statement is true. Explain your reasoning.

5. $\Delta RST \cong \Delta TQP$



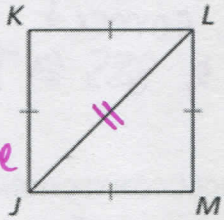
no $\overline{RS} \cong \overline{QP}$

6. $\Delta ABD \cong \Delta CDB$



yes
$\overline{AB} \cong \overline{CD}$
$\overline{BD} \cong \overline{DB}$ Reflexive
$\overline{BC} \cong \overline{AD}$

7. $\Delta JKL \cong \Delta LJM$

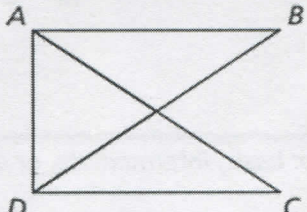


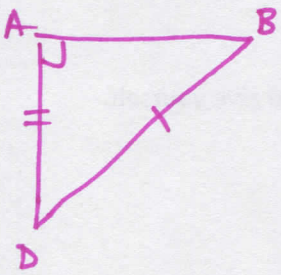
no
$\overline{JL} \cong \overline{JL}$

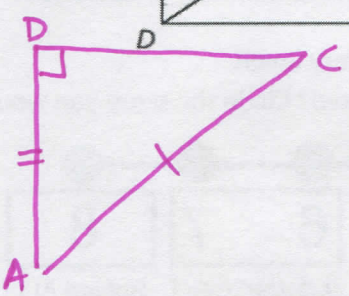
Redraw the triangles so they are side by side with corresponding parts in the same position. Then write a proof.

8. **Given** $\overline{AC} \cong \overline{BD}$, $\overline{AB} \perp \overline{AD}$, $\overline{CD} \perp \overline{AD}$

Prove $\triangle BAD \cong \triangle CDA$



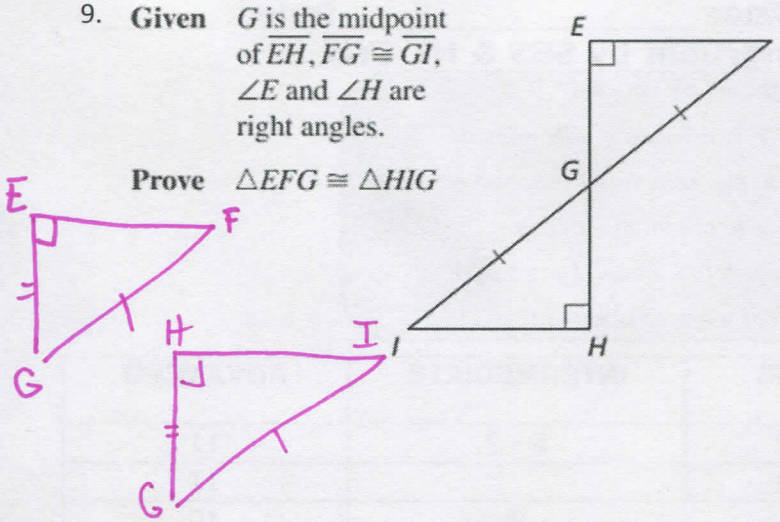




Statements	Reasons
1. $\overline{AC} \cong \overline{BD}$; $\overline{AB} \perp \overline{AD}$ $\overline{CD} \perp \overline{AD}$	1. Given
2. $\overline{AD} \cong \overline{AD}$	2. Reflexive POC
3. $\angle BAD$ & $\angle CDA$ R Rt $\triangle$s	3. Def of $\perp$ lines
4. $\triangle BAD$ & $\triangle CDA$ R Rt $\triangle$s	4. Def of Right $\triangle$
5. $\triangle BAD \cong \triangle CDA$	5. HL $\cong$ Thm

9. **Given** G is the midpoint of $\overline{EH}$, $\overline{FG} \cong \overline{GI}$, $\angle E$ and $\angle H$ are right angles.

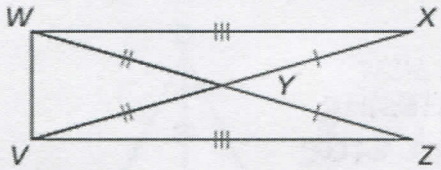
Prove $\triangle EFG \cong \triangle HIG$



Statements	Reasons
1. G is the mdpt of $\overline{EH}$, $\overline{FG} \cong \overline{GI}$; $\angle E$ & $\angle H$ are Rt $\angle$'s	1. Given
2. $\overline{EG} \cong \overline{HG}$	2. Def of mdpt
3. $\triangle EFG$ & $\triangle HIG$ R Rt $\triangle$ s	3. Def of Rt $\triangle$
4. $\triangle EFG \cong \triangle HIG$	4. HL $\cong$ Thm

10. **Given** $\overline{WX} \cong \overline{VZ}, \overline{WY} \cong \overline{VY}, \overline{YZ} \cong \overline{YX}$

Prove $\triangle VWX \cong \triangle WVZ$

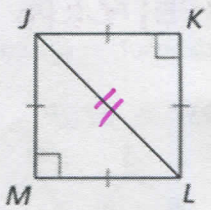


Statements	Reasons
1. $\overline{WX} \cong \overline{VZ}$; $\overline{WY} \cong \overline{VY}$; $\overline{YZ} \cong \overline{YX}$	1. Given
2. $\overline{WV} \cong \overline{WV}$	2. Reflexive POC
3. $WY = VY$; $YZ = YX$	3. If $\cong \Rightarrow =$.
4. $WZ = WY + YZ$; $VX = WY + YX$	4. Seg. Add. Post.
5. $VX = WY + YZ$	5. Substitution POE
6. $VX = WZ$	6. Transitive POE
7. $\overline{VX} \cong \overline{WZ}$	7. If $= \Rightarrow \cong$.
8. $\triangle VWX \cong \triangle WVZ$	8. SSS $\cong$ Thm

11. **MAKING AN ARGUMENT** Your cousin says that ΔJKL is congruent to ΔLMJ by SSS Congruence Theorem. Your friend says that ΔJKL is congruent to ΔLMJ by HL Congruence Theorem. Who is correct? Explain your reasoning.

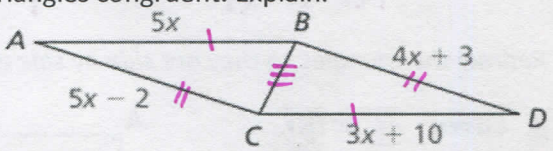
Reflexive

Both are correct.
HL $\cong$ Thm & SSS $\cong$ Thm both work.



12. **MATHEMATICAL CONNECTIONS** Find all values of x that make the triangles congruent. Explain.

$x = 5$ $\triangle ABC \cong \triangle DCB$
$x \neq 3$ & $x \neq 6$



CYU Reflection: *How far can you go: basic, intermediate, or advanced?*

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yourself.