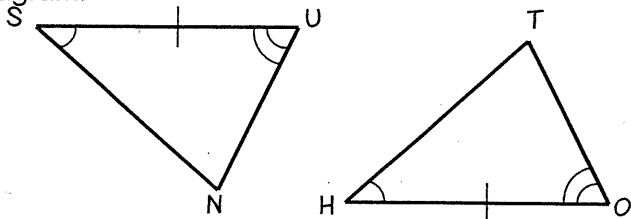


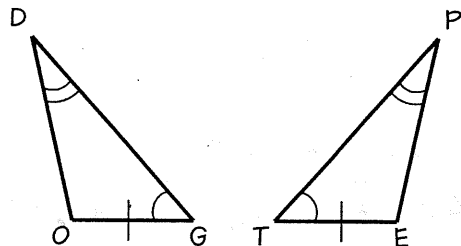
**Angle-Side-Angle Congruence Postulate ( $ASA \cong$  Postulate):** If two angles and the \_\_\_\_\_ side of one triangle are congruent with two angles and the included side of another triangle, then the triangles are congruent.

Diagram:



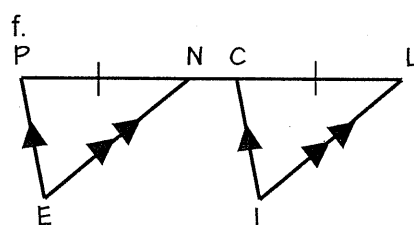
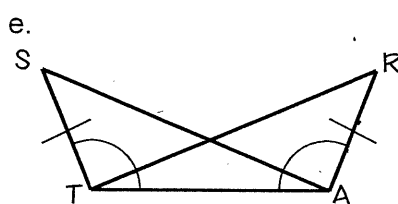
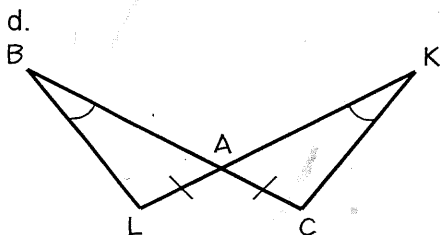
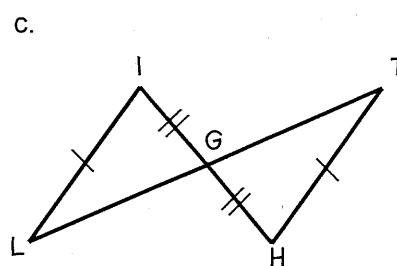
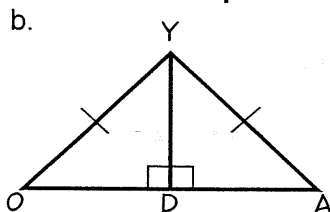
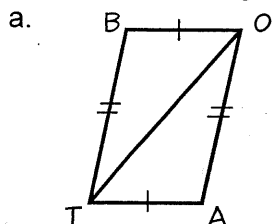
**Angle-Angle-Side Congruence Theorem ( $AAS \cong$  Theorem):** If two \_\_\_\_\_ and a non-included side of one triangle are congruent with two angles and the non-included side of a second triangle, then the two triangles are congruent.

Diagram:



Remember,  $SSA \cong$  and  $AAA \cong$  are **NOT** a valid ways to prove triangles congruent.

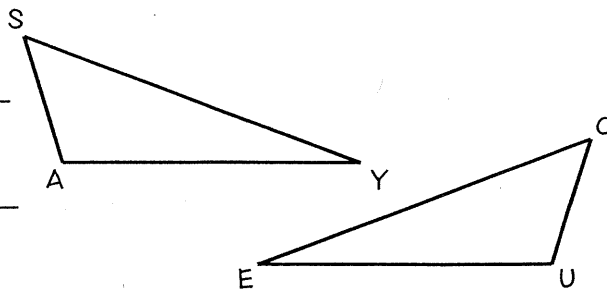
**Example 1:** Determine if there is enough information given in the figures to have two triangles congruent. If so, write the congruence statement and name the postulate or theorem used.



**Example 2:** State the third congruence that is needed to prove that  $\triangle SAY \cong \triangle CUE$  using the indicated postulate or theorem.

a. GIVEN:  $\overline{SA} \cong \overline{CU}$ ,  $\overline{SY} \cong \overline{CE}$ , and \_\_\_\_\_  $\cong$  \_\_\_\_\_  
Use the SSS  $\cong$  Postulate.

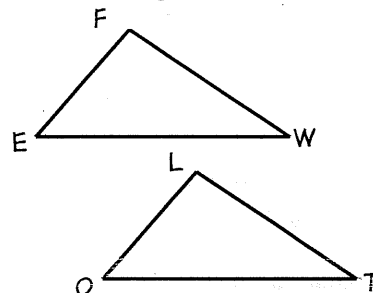
b. GIVEN:  $\angle A \cong \angle U$ ,  $\angle Y \cong \angle E$ , and \_\_\_\_\_  $\cong$  \_\_\_\_\_  
Use the AAS  $\cong$  Theorem.



**Example 3:** State the third congruence that is needed to prove that  $\triangle FEW \cong \triangle LOT$  using the indicated postulate or theorem.

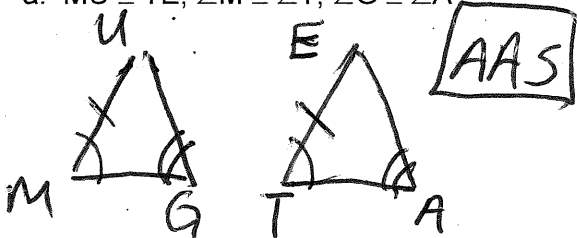
a. GIVEN:  $\angle F$  is a right angle,  $\angle F \cong \angle L$ ,  $\overline{FE} \cong \overline{LO}$ , and \_\_\_\_\_  $\cong$  \_\_\_\_\_  
Use the HL  $\cong$  Theorem.

b. GIVEN:  $\overline{EW} \cong \overline{OT}$ ,  $\angle E \cong \angle O$ , and \_\_\_\_\_  $\cong$  \_\_\_\_\_  
Use the ASA  $\cong$  Postulate.

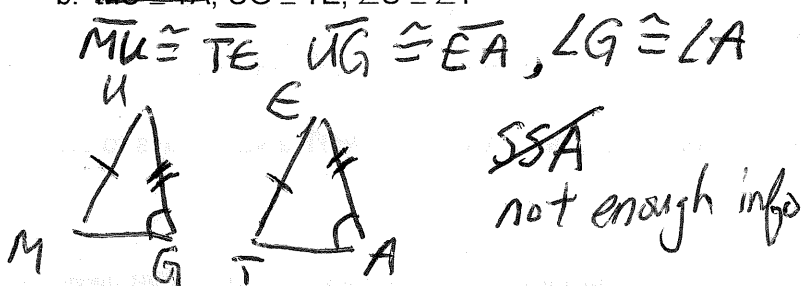


**Example 4:** Tell whether you can use the given information to determine whether  $\triangle MUG$  and  $\triangle TEA$  are congruent. Explain your reasoning. It might help to draw the given information.

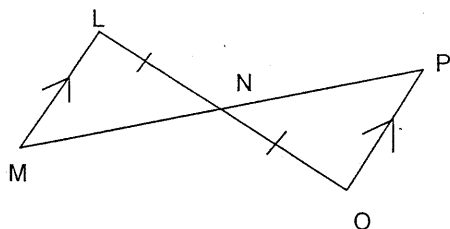
a.  $\overline{MU} \cong \overline{TE}$ ,  $\angle M \cong \angle T$ ,  $\angle G \cong \angle A$



b.  ~~$\overline{MU} \cong \overline{TA}$ ,  $\overline{UG} \cong \overline{TE}$ ,  $\angle U \cong \angle T$~~



**Example 5: Proving Triangles are Congruent**



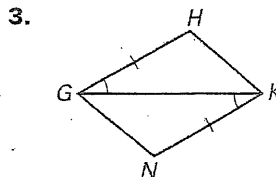
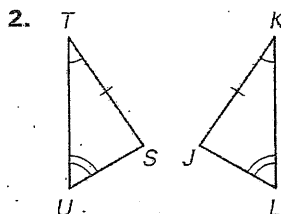
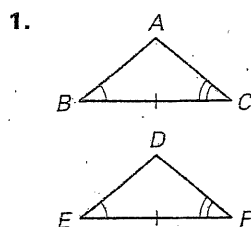
Given:  $\overline{LM} \parallel \overline{OP}$ ,  $\overline{LN} \cong \overline{NO}$

Prove:  $\triangle MNL \cong \triangle PNO$

Statements	Reasons
1.	1. Given
2.	2. Given
3.	3.
4.	4.
5.	5.

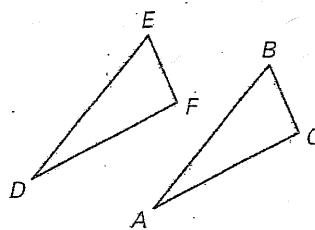
**LESSON**  
**4.10 Practice**

Is it possible to prove that the triangles are congruent? If so, state the postulate or theorem you would use.



State the third congruence that is needed to prove that  $\triangle DEF \cong \triangle ABC$  using the given postulate or theorem.

4. GIVEN:  $\overline{DE} \cong \overline{AB}$ ,  $\angle D \cong \angle A$ ,  $\underline{\quad} \cong \underline{\quad}$   
 Use the AAS Congruence Theorem.

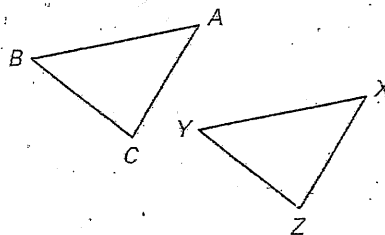


5. GIVEN:  $\overline{FE} \cong \overline{CB}$ ,  $\angle F \cong \angle C$ ,  $\underline{\quad} \cong \underline{\quad}$   
 Use the ASA Congruence Postulate.

6. GIVEN:  $\overline{DF} \cong \overline{AC}$ ,  $\angle F \cong \angle C$ ,  $\underline{\quad} \cong \underline{\quad}$   
 Use the SAS Congruence Theorem.

State the third congruence that is needed to prove that  $\triangle ABC \cong \triangle XYZ$  using the given postulate or theorem.

7. GIVEN:  $\angle C \cong \angle Z$ ,  $\overline{AC} \cong \overline{XZ}$ ,  $\underline{\quad} \cong \underline{\quad}$   
 Use the AAS Congruence Theorem.



8. GIVEN:  $\angle B \cong \angle Y$ ,  $\overline{AB} \cong \overline{XY}$ ,  $\underline{\quad} \cong \underline{\quad}$   
 Use the ASA Congruence Postulate.

9. GIVEN:  $\overline{BC} \cong \overline{YZ}$ ,  $\angle B \cong \angle Y$ ,  $\underline{\quad} \cong \underline{\quad}$   
 Use the SAS Congruence Theorem.

LESSON  
4.10**Practice** *continued*

Tell whether you can use the given information to determine whether  $\triangle JKL \cong \triangle RST$ .

10.  $\angle J \cong \angle R, \angle K \cong \angle S, \angle L \cong \angle T$

11.  $\overline{JK} \cong \overline{RS}, \angle J \cong \angle R, \angle L \cong \angle T$

12.  $\angle K \cong \angle S, \angle L \cong \angle T, \overline{KL} \cong \overline{ST}$

13.  $\angle J \cong \angle R, \overline{KL} \cong \overline{ST}$

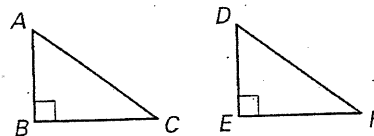
14. **Multiple Choice** Which postulate or theorem can you use to prove that  $\triangle ABC \cong \triangle DEF$ ?

A. AAS

B. ASA

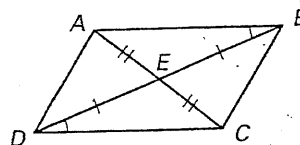
C. SAS

D. Not enough information



**Explain** how you can prove that the indicated triangles are congruent using the given postulate or theorem.

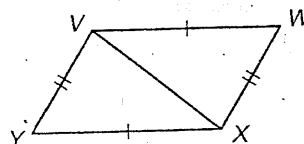
- 15.
- $\triangle ABE \cong \triangle CDE$
- by SAS



- 16.
- $\triangle ABE \cong \triangle CDE$
- by ASA

- 17.
- $\triangle ABE \cong \triangle CDE$
- by AAS

- 18.
- Proof**
- Complete the proof.

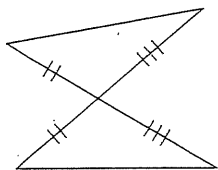
GIVEN:  $\overline{VW} \cong \overline{XY}, \overline{WX} \cong \overline{YV}$ PROVE:  $\triangle VWX \cong \triangle XYV$ 

Statements	Reasons
1. $\overline{VW} \cong \overline{XY}$	1.
2. $\overline{WX} \cong \overline{YV}$	2.
3. $\overline{VX} \cong \overline{YX}$	3.
4. $\triangle VWX \cong \triangle XYV$	4.

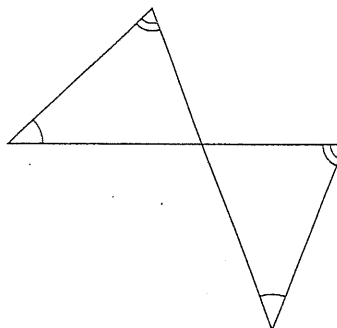
# Triangle congruence

State if the two triangles are congruent. If they are, state how you know.

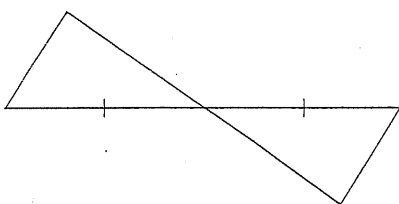
1)



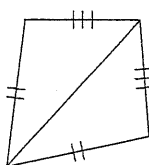
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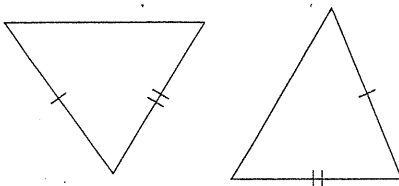
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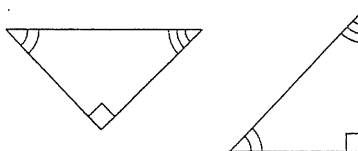
4)



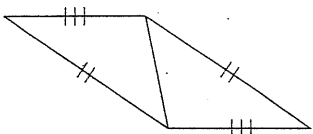
5)



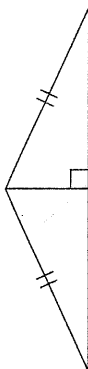
6)



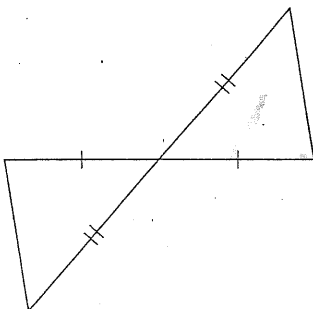
7)



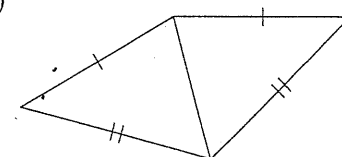
8)



9)

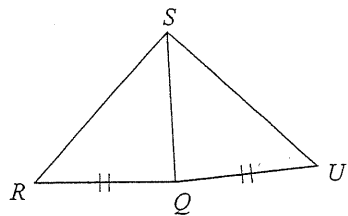


10)

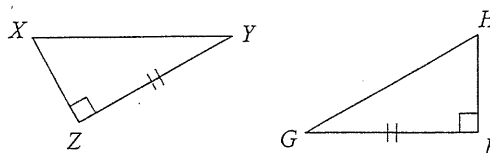


State what additional information is required in order to know that the triangles are congruent for the reason given.

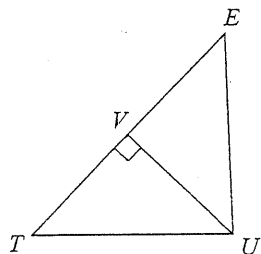
11) SSS



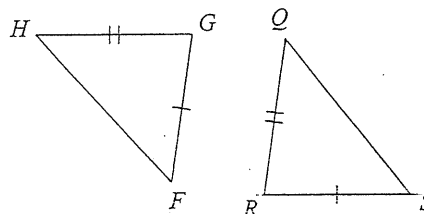
12) HL



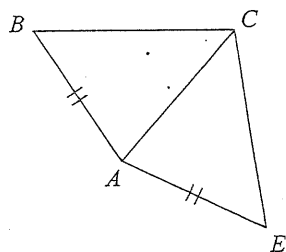
13) HL



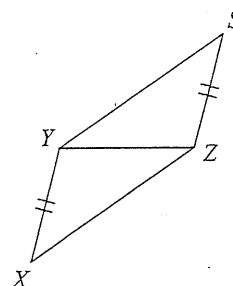
14) SAS



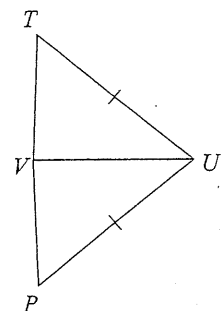
15) SSS



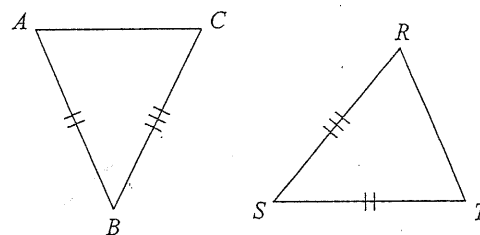
16) SAS



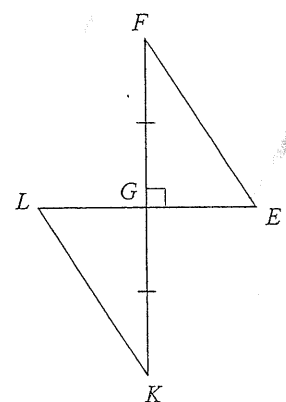
17) SAS



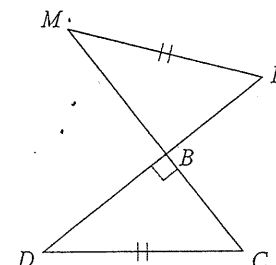
18) SSS



19) HL



20) HL



Name

Key

Date

9/17/14

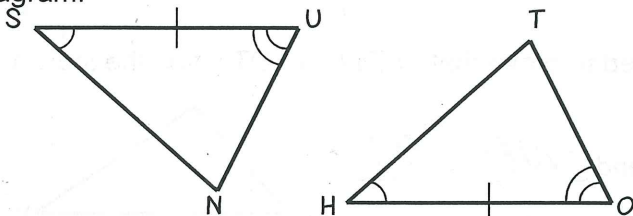
Period

(Wed)

CCGPS Analytic Geometry – September 17  
Triangle Congruence Notes  
Day 3: ASA and AAS

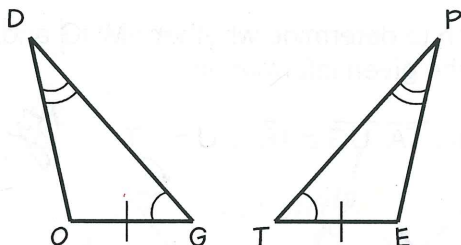
**Angle-Side-Angle Congruence Postulate ( $ASA \cong$  Postulate):** If two angles and the included side of one triangle are congruent with two angles and the included side of another triangle, then the triangles are congruent.

Diagram:



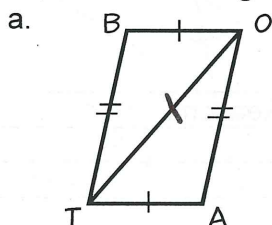
**Angle-Angle-Side Congruence Theorem ( $AAS \cong$  Theorem):** If two angles and a non-included side of one triangle are congruent with two angles and the non-included side of a second triangle, then the two triangles are congruent.

Diagram:

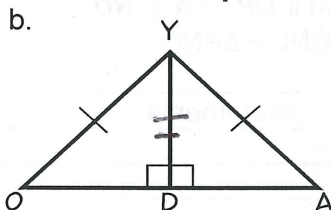


Remember,  $SSA \cong$  and  $AAA \cong$  are **NOT** a valid ways to prove triangles congruent.

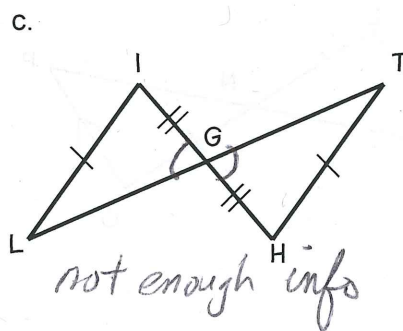
**Example 1:** Determine if there is enough information given in the figures to have two triangles congruent. If so, write the congruence statement and name the postulate or theorem used.



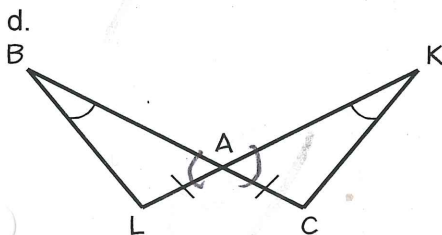
By SSS  $\triangle OTB \cong \triangle TOA$



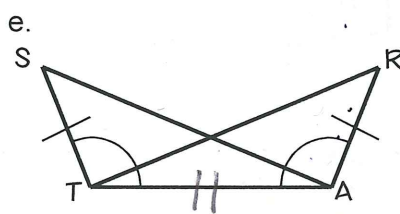
By HL  
 $\triangle OYD \cong \triangle AYD$



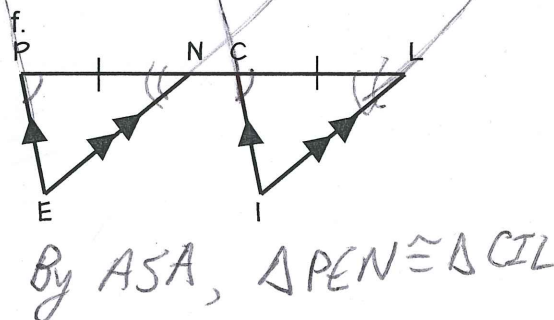
not enough info



By AAS  
 $\triangle LBA \cong \triangle KCA$



By SAS  
 $\triangle STA \cong \triangle RAT$

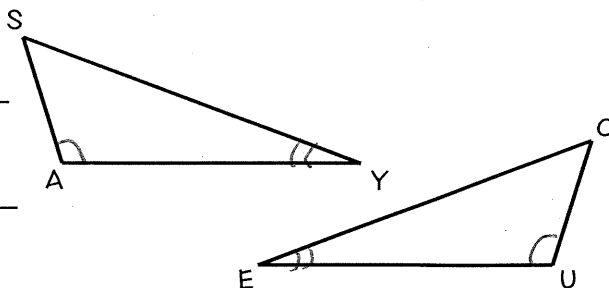


By ASA,  $\triangle PEN \cong \triangle CIL$

**Example 2:** State the third congruence that is needed to prove that  $\triangle SAY \cong \triangle CUE$  using the indicated postulate or theorem.

a. GIVEN:  $\overline{SA} \cong \overline{CU}$ ,  $\overline{SY} \cong \overline{CE}$ , and \_\_\_\_\_  $\cong$  \_\_\_\_\_  
Use the SSS  $\cong$  Postulate.

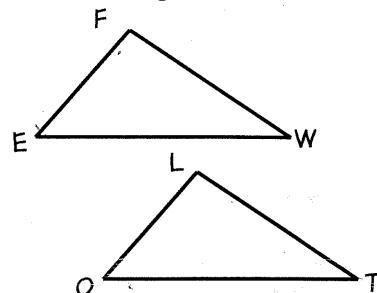
b. GIVEN:  $\angle A \cong \angle U$ ,  $\angle Y \cong \angle E$ , and  $\overline{SY} \cong \overline{CE}$   
Use the AAS  $\cong$  Theorem.



**Example 3:** State the third congruence that is needed to prove that  $\triangle FEW \cong \triangle LOT$  using the indicated postulate or theorem.

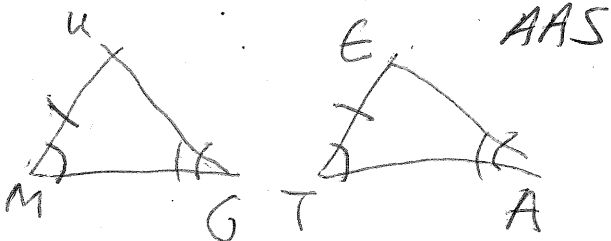
a. GIVEN:  $\angle F$  is a right angle,  $\angle F \cong \angle L$ ,  $\overline{FE} \cong \overline{LO}$ , and  $\overline{WE} \cong \overline{OT}$   
Use the HL  $\cong$  Theorem.

b. GIVEN:  $\overline{EW} \cong \overline{OT}$ ,  $\angle E \cong \angle O$ , and  $\angle W \cong \angle T$   
Use the ASA  $\cong$  Postulate.

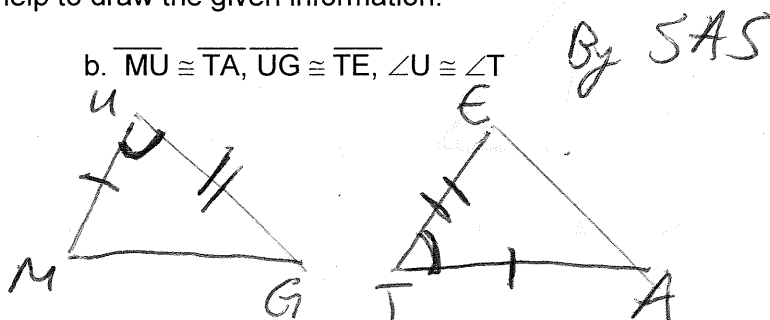


**Example 4:** Tell whether you can use the given information to determine whether  $\triangle MUG$  and  $\triangle TEA$  are congruent. Explain your reasoning. It might help to draw the given information.

a.  $\overline{MU} \cong \overline{TE}$ ,  $\angle M \cong \angle T$ ,  $\angle G \cong \angle A$



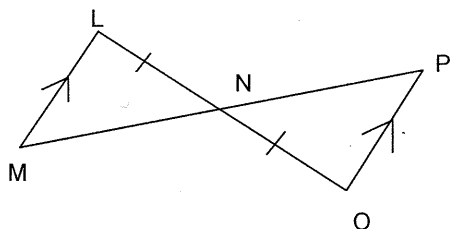
b.  $\overline{MU} \cong \overline{TA}$ ,  $\overline{UG} \cong \overline{TE}$ ,  $\angle U \cong \angle T$



**Example 5: Proving Triangles are Congruent**

Given:  $\overline{LM} \parallel \overline{OP}$ ,  $\overline{LN} \cong \overline{NO}$

Prove:  $\triangle MNL \cong \triangle PNO$

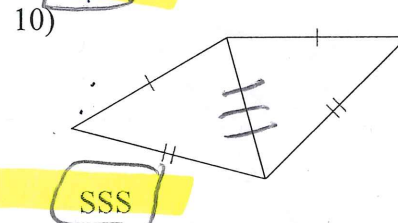
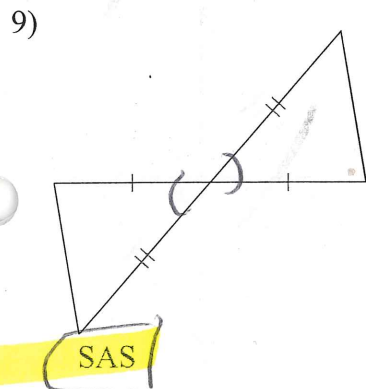
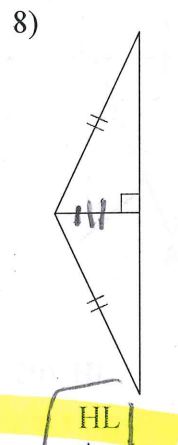
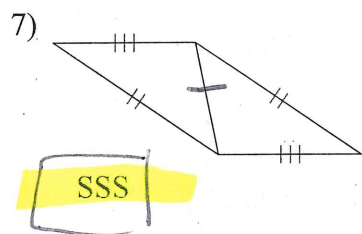
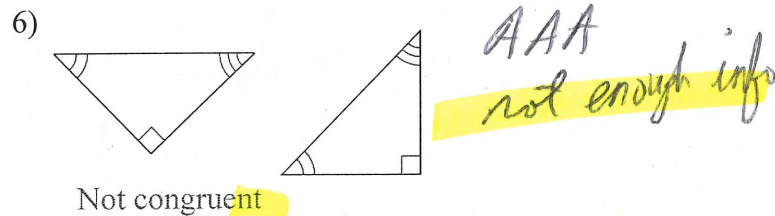
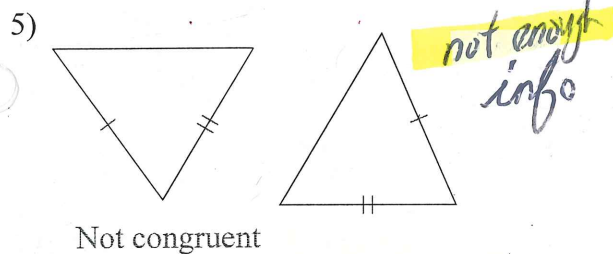
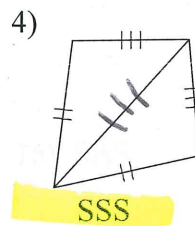
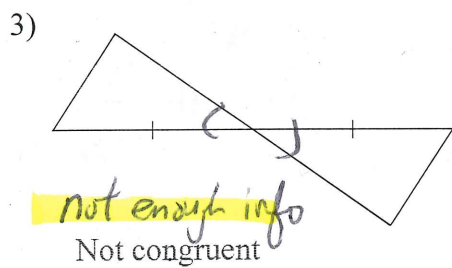
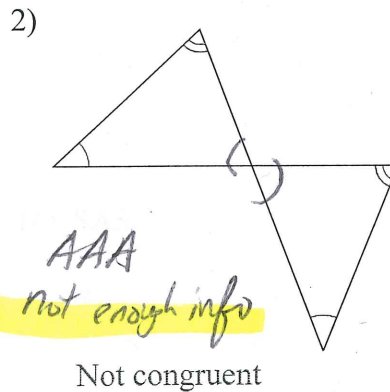
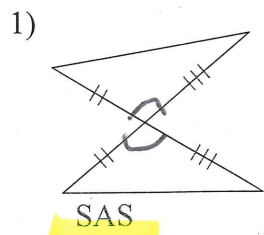


Statements	Reasons
1.	1. Given
2.	2. Given
3.	3.
4.	4.
5.	5.



# Triangle congruence

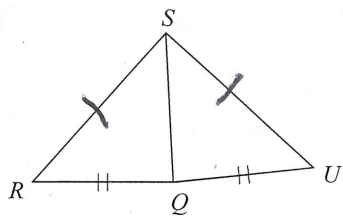
State if the two triangles are congruent. If they are, state how you know.



State what additional information is required in order to know that the triangles are congruent for the reason given.

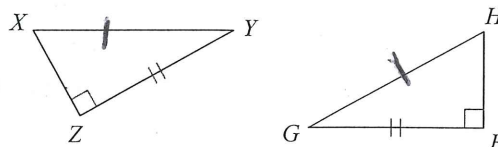
11) SSS

$$\overline{RS} \cong \overline{US}$$



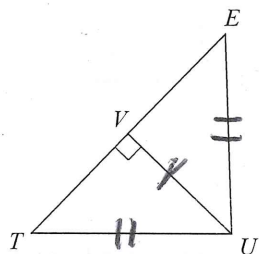
12) HL

$$\overline{YX} \cong \overline{GH}$$



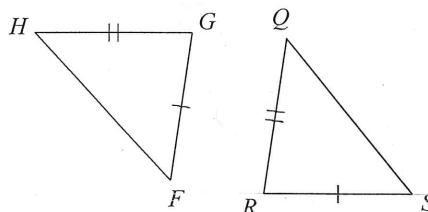
13) HL

$$\overline{UT} \cong \overline{UE}$$



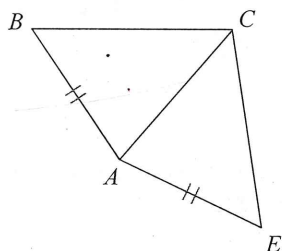
14) SAS

$$\angle G \cong \angle R$$



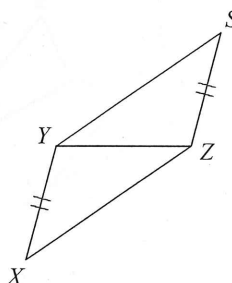
15) SSS

$$\overline{BC} \cong \overline{EC}$$



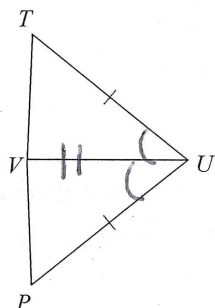
16) SAS

$$\angle XYZ \cong \angle SZY$$



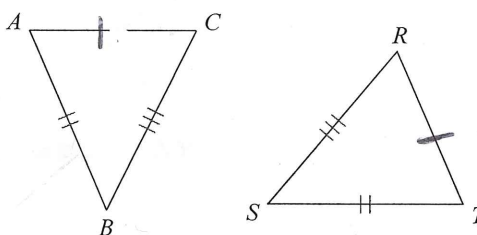
17) SAS

$$\angle TUV \cong \angle PUV$$



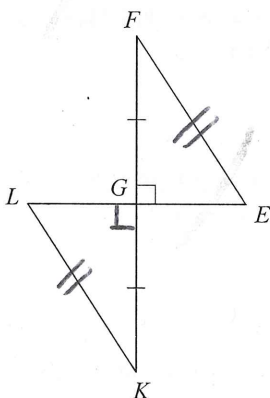
18) SSS

$$\overline{CA} \cong \overline{RT}$$



19) HL

$$\overline{FE} \cong \overline{KL}$$



20) HL

$$\overline{BC} \cong \overline{BL} \text{ or } \overline{DB} \cong \overline{MB}$$

