

# Section 4-3: Triangle Congruence by ASA and AAS

Take note

## Postulate 4-3 Angle-Side-Angle (ASA) Postulate

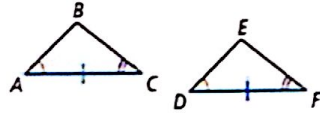
### Postulate

If two angles and the included side of one triangle are congruent to two angles and the included side of another triangle, then the two triangles are congruent.

If ...

$$\angle A \cong \angle D, \overline{AC} \cong \overline{DF},$$

$$\angle C \cong \angle F$$



Then ...

$$\triangle ABC \cong \triangle DEF$$

Take note

## Theorem 4-2 Angle-Angle-Side (AAS) Theorem

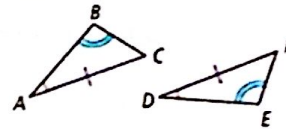
### Theorem

If two angles and a nonincluded side of one triangle are congruent to two angles and the corresponding nonincluded side of another triangle, then the triangles are congruent.

If ...

$$\angle A \cong \angle D, \angle B \cong \angle E,$$

$$\overline{AC} \cong \overline{DF}$$



Then ...

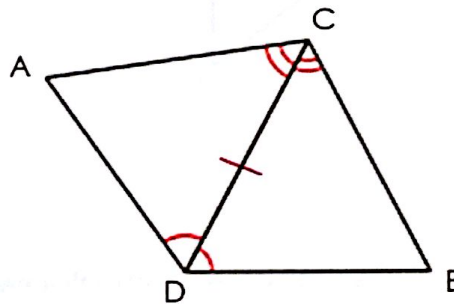
$$\triangle ABC \cong \triangle DEF$$

### Example 1:

Are there any congruent triangles in this diagram. If so, write a congruence statement and explain how you know they are congruent.

$$\overline{CD} \cong \overline{CD}$$

Reflexive Prop



$$\triangle DCA \cong \triangle DCB$$

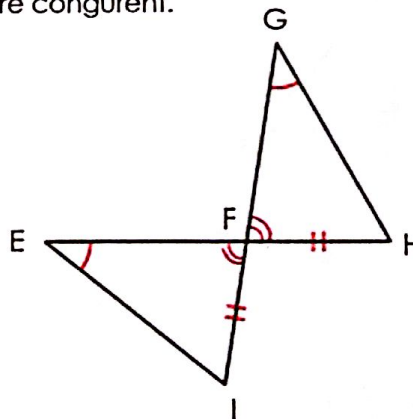
by ASA

### Example 2:

Are there any congruent triangles in this diagram. If so, write a congruence statement and explain how you know they are congruent.

$$\angle EFI \cong \angle GFH$$

Vertical  $\angle$ s are  $\cong$



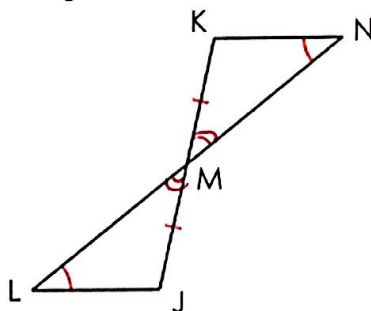
$$\triangle EFI \cong \triangle GFH$$

by AAS

Example 3:

Are there any congruent triangles in this diagram. If so, write a congruence statement and explain how you know they are congruent.

$\triangle LMJ \cong \triangle KMN$   
 \ Vertical  $\angle$ s  
 are  $\cong$

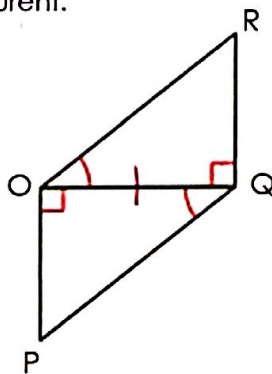


$\triangle NMK \cong \triangle LMJ$   
 by AAS

Example 4:

Are there any congruent triangles in this diagram. If so, write a congruence statement and explain how you know they are congruent.

$\overline{OQ} \cong \overline{OQ}$   
 Reflexive Prop

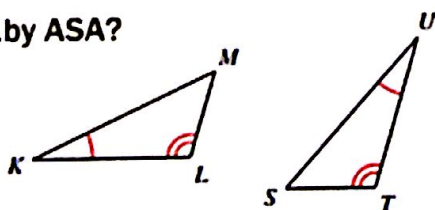


$\triangle OQR \cong \triangle OQP$   
 by ASA

Example 5:

What additional information would we need to prove a pair of triangles are congruent by the given theorem. (Also name the congruent triangles)

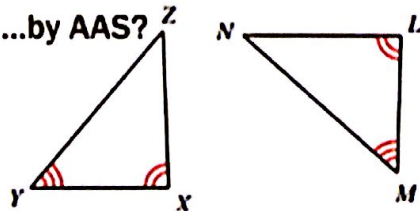
a. ...by ASA?



$\overline{KL} \cong \overline{UT}$

$(\triangle KLM \cong \triangle UTS)$

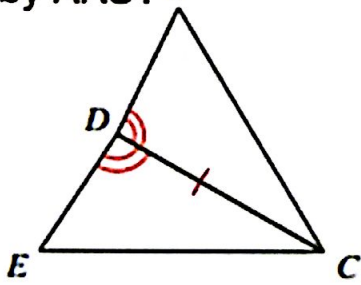
b. ...by AAS?



$\overline{XZ} \cong \overline{NL}$   $\overline{YZ} \cong \overline{Nm}$

$(\triangle XYZ \cong \triangle LMN)$

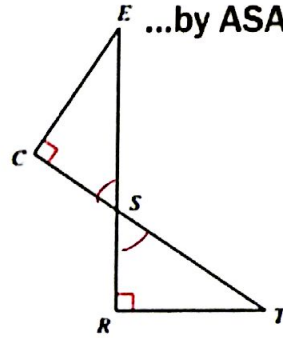
c. ...by AAS? T



$$\angle E \cong \angle T$$

$$(\triangle EDC \cong \triangle TDC)$$

d. ...by ASA?



$$\overline{CS} \cong \overline{RS}$$

$$(\triangle SCE \cong \triangle SRT)$$

**Good**

**Bad**

SSS

SAS

ASA

AAS

AAA

SSA



	3 Sides	2 Sides	1 Side	0 Sides
<b>Good</b> (Can be used to prove triangles congruent)	SSS	SAS	ASA AAS	
<b>Bad</b> (Cannot be used to prove triangles congruent)		SSA		AAA

