4-3 Triangle Congruence by ASA and AAS

Content Standard
G.SRT.5 Use congruence . . . criteria for triangles to solve problems and prove relationships in geometric figures.

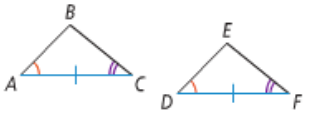
Objective To prove two triangles congruent using the ASA Postulate and the AAS Theorem

Take note

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

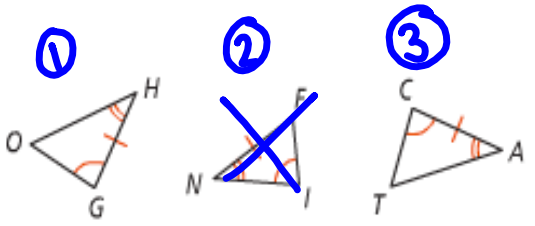
Postulate
If two angles and the included side of one triangle are congruent to two angles and the included side of another triangle, then the two triangles are congruent.

If . . .
$\angle A \cong \angle D$, $\overline{AC} \cong \overline{DF}$, $\angle C \cong \angle F$



Then . . .
$\triangle ABC \cong \triangle DEF$

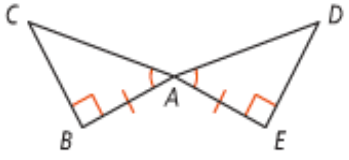
1. Which two triangles are congruent by ASA? Explain.



$\triangle HOG \cong \triangle ATC$

2. Given: $\angle CAB \cong \angle DAE$, $\overline{BA} \cong \overline{EA}$, $\angle B$ and $\angle E$ are right angles

Prove: $\triangle ABC \cong \triangle AED$

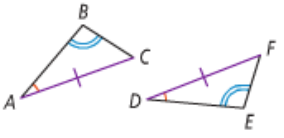


ASA

Statements	Reasons
1. $\angle CAB \cong \angle DAE$, $\overline{BA} \cong \overline{EA}$, $\angle B$ and $\angle E$ are rt. $\angle$s	1. Given
2. $\angle B \cong \angle E$	2. All rt. $\angle$s are $\cong$
3. $\triangle ABC \cong \triangle AED$	3. ASA

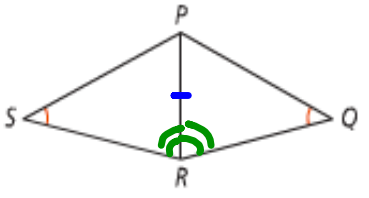
take note

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

Theorem	If . . .	Then . . .
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.	$\angle A \cong \angle D, \angle B \cong \angle E,$ $\overline{AC} \cong \overline{DF}$ 	$\triangle ABC \cong \triangle DEF$

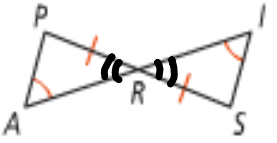
3. a. Given: $\angle S \cong \angle Q$, $\overline{RP}$ bisects $\angle SRQ$

Prove: $\triangle SRP \cong \triangle QRP$



Statements	Reasons
1. $\angle S \cong \angle Q$, $\overline{RP}$ bisects $\angle SRQ$	1. Given
2. $\overline{PR} \cong \overline{PR}$	2. Reflexive Prop. of $\cong$
3. $\angle SRP \cong \angle QRP$	3. def. of bisect
4. $\triangle SRP \cong \triangle QRP$	4. AAS

4. Are $\triangle PAR$ and $\triangle SIR$ congruent? Explain.



$\angle PRA \cong \angle SRI$ Vertical $\angle$s Thm

$\triangle PAR \cong \triangle SIR$ AAS