Geometry H

Name: Key

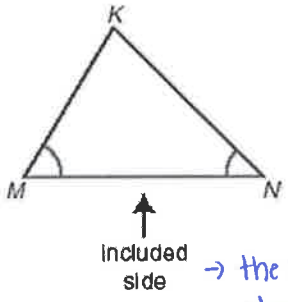
4.5 Notes - ASA and AAS

Date: _____ Period: _____

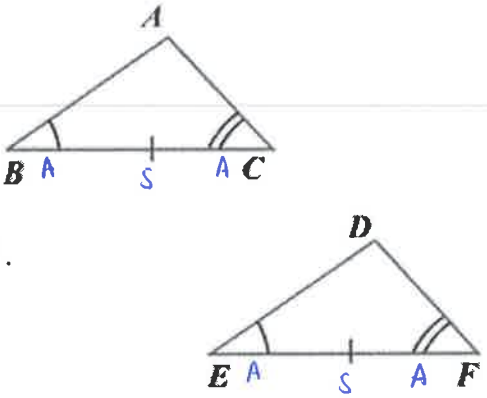
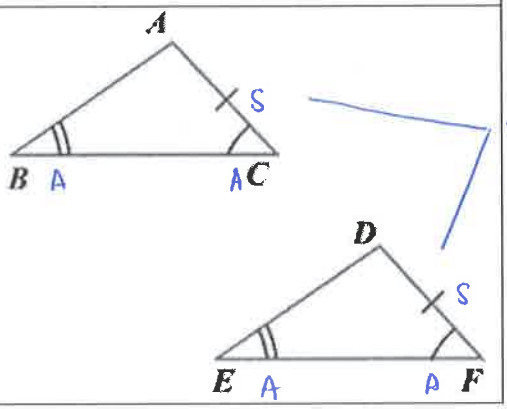
LEARNING TARGETS

- I can prove triangles congruent using ASA.
- I can prove triangle congruent using AAS.

An included side is the side that links two angles together. In the diagram below, $\overline{MN}$ is the included side of $\angle M$ and $\angle N$.



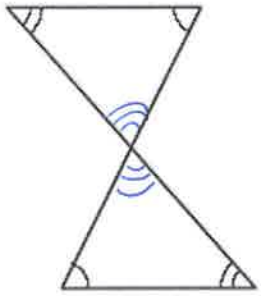
→ the included side connects the two marked angles together

ASA Congruence Theorem (ASA) If two angles and the included side of one triangle are congruent to two angles and the included side of a second triangle, then the two triangles are congruent.	**Example:** If **Angle** $\angle B \cong \angle E$ **Side** $\overline{BC} \cong \overline{EF}$ **Angle** $\angle C \cong \angle F$ then, $\Delta ABC \cong \Delta DEF$. 
AAS Congruence Theorem (AAS) If two angles and the non-included side of one triangle are congruent to two angles and the corresponding non-included side of a second triangle, then the two triangles are congruent.	**Example:** If **Angle** $\angle C \cong \angle F$ **Angle** $\angle B \cong \angle E$ **Side** $\overline{AC} \cong \overline{DF}$ then $\Delta ABC \cong \Delta DEF$.  side is outside the two marked angles

Example 1: Identify Congruent Triangles

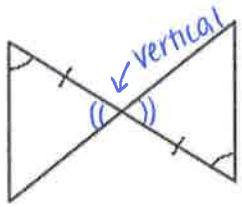
Can the triangles be proven congruent based on the given information in the diagram? If so, state the postulate or theorem you would use. If not, why not?

a)



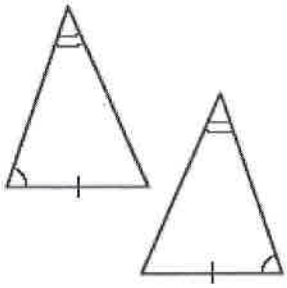
No, no angle-angle-angle

b)



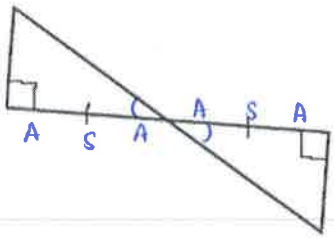
Yes, by ASA

c)



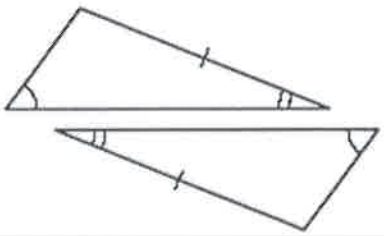
Yes, by AAS

d)



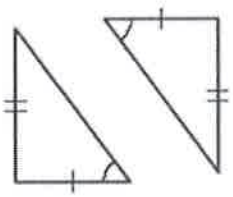
Yes, by ASA

e)



Yes, by AAS

f)

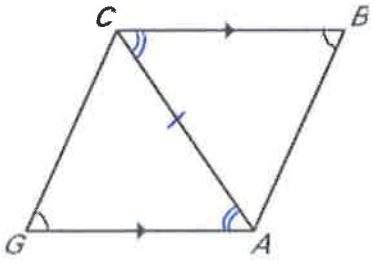


No, no side-side-angle

Example 2: Write a two-column proof

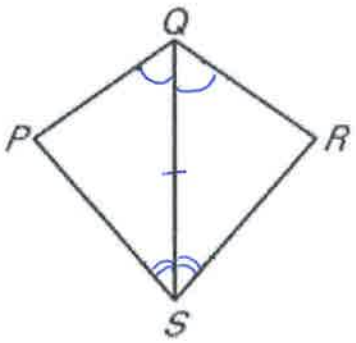
a) Given: $\angle G \cong \angle B$, $\overline{CB} \parallel \overline{GA}$

Prove: $\Delta GCA \cong \Delta BAC$



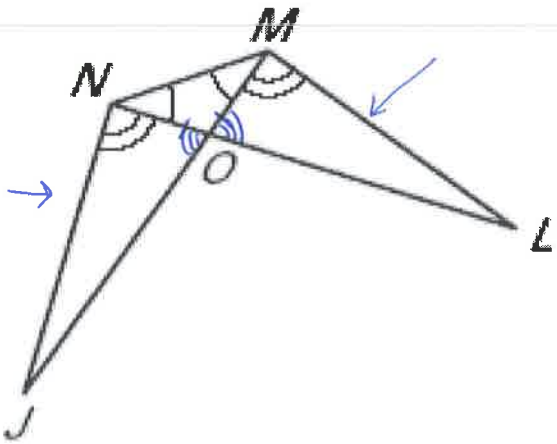
Statements	Reasons
1. $\angle G \cong \angle B$	1. Given
2. $\overline{CB} \parallel \overline{GA}$	2. Given
3. $\angle BCA \cong \angle GAC$	3. Alternate Interior Angles Theorem
4. $\overline{AC} \cong \overline{AC}$	4. Reflexive Property
5. $\Delta GCA \cong \Delta BAC$	5. AAS

b) Given: $\overline{QS}$ bisects $\angle PQR$ and $\angle PSR$
Prove: $\triangle PSQ \cong \triangle RSQ$



Statements	Reasons
1. $\overline{QS}$ bisects $\angle PQR$	1. Given
2. $\angle PQS \cong \angle RQS$	2. Def of angle bisector
3. $\overline{QS}$ bisects $\angle PSR$	3. Given
4. $\angle PSQ \cong \angle RSQ$	4. Def of angle bisector
5. $\overline{QS} \cong \overline{QS}$	5. Reflexive Prop
6. $\triangle PSQ \cong \triangle RSQ$	6. ASA

c) Given: $\angle OMN \cong \angle ONM$, $\angle JNO \cong \angle LMO$
Prove: $\triangle NOJ \cong \triangle MOL$



Statements	Reasons
1. $\angle OMN \cong \angle ONM$	1. Given
2. $\overline{NO} \cong \overline{MO}$	2. Base Angles converse
3. $\angle NOJ \cong \angle MOL$	3. VAT
4. $\angle JNO \cong \angle LMO$	4. Given
5. $\triangle NOJ \cong \triangle MOL$	5. ASA