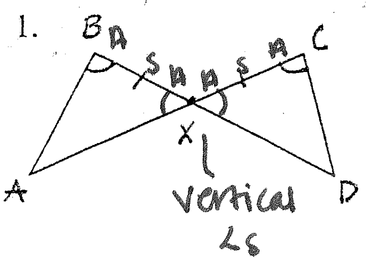
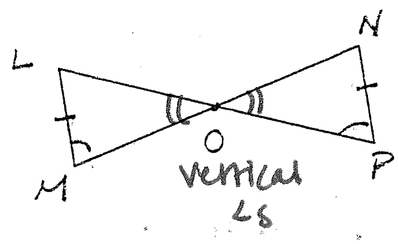
Can you prove the following triangles are congruent? (NOTES)
If so, state which theorem you would use. (ASA or AAS)

1.



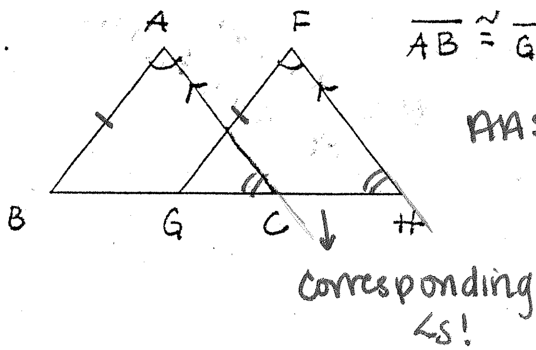
ASA.

2.



AAS.

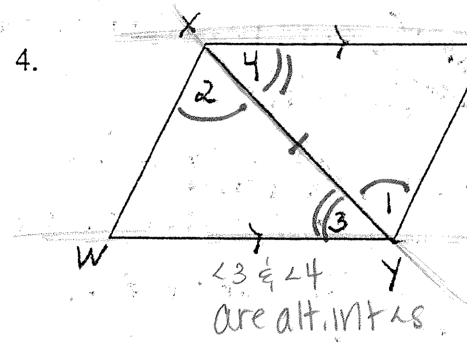
3.



$\overline{AB} \cong \overline{GF}$

AAS.

4.

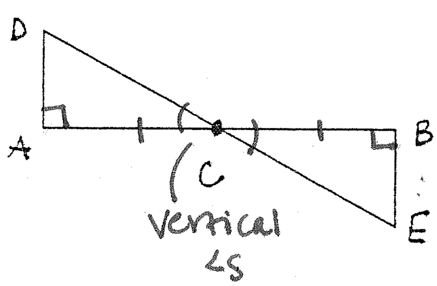


m∠1 = m∠2

ASA

Could use 3rd ∠ Thm & AAS/ASA for ca.?

5.

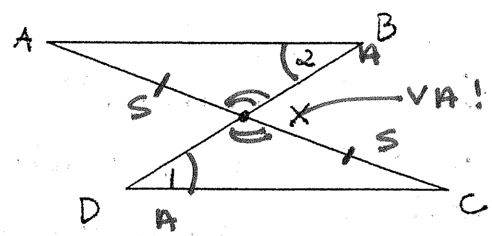


C is the midpoint of $\overline{AB}$.
$\overline{AD} \perp \overline{AB}$
$\overline{BE} \perp \overline{AB}$

ASA
why not HL?

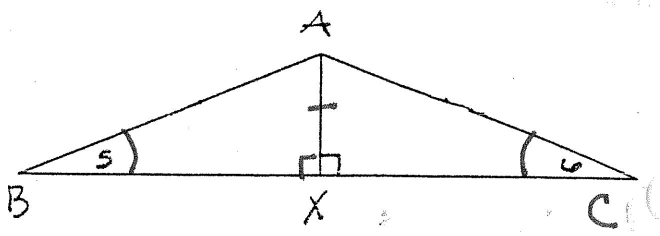
PROOFS (EXAMPLE 1)

Given: m∠1 = m∠2
X is the midpoint of $\overline{AC}$
Prove: $\triangle ABX \cong \triangle CDX$



Statements	Reasons
1. m∠1 = m∠2	1. Given
2. ∠1 ≅ ∠2	2. Def. of cong ∠s
3. X is the midpt of $\overline{AC}$.	3. Given
4. $\overline{AX} \cong$ ~~$\overline{BX}$~~	4. Def. of midpt
5. ∠BXA and ∠DXC are V.A.	5. Def. of V.A.
6. ∠BXA ≅ ∠DXC	6. V.A. Thm
7. [illegible]	7. AAS Post.

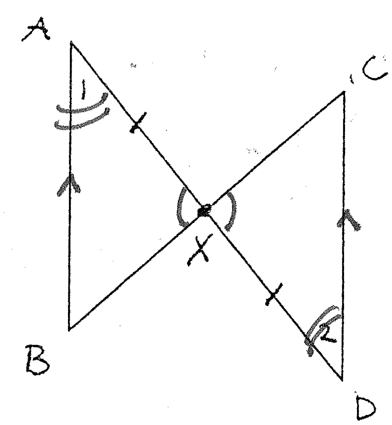
Given: $m\angle 5 = m\angle 6$
$\overline{AX} \perp \overline{BC}$
Prove: $\Delta AXB \cong \Delta AXC$



Statements	Reasons
1. $m\angle 5 = m\angle 6$	1. Given
2. $\angle 5 \cong \angle 6$	2. Def of $\cong$ angles
3. $\overline{AX} \cong \overline{AX}$	3. Reflexive Prop of $\cong$
4. $\overline{AX} \perp \overline{BC}$ → $\angle AXB$ and $\angle AXC$ are rt $\angle$s	4. Given
5. $m\angle AXB = 90°$ $m\angle AXC = 90°$	5. Def. of $\perp$ lines → Def of rt. $\angle$s
6. $m\angle AXB = m\angle AXC$	6. Subst. prop of =
7. $\angle AXB \cong \angle AXC$	7. Def of $\cong$ $\angle$s
8. $\Delta AXB \cong \Delta AXC$	8. AAS Post.

could use rt angle $\cong$ Thm.

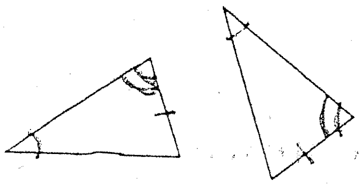
Given: $\overline{AB} \parallel \overline{DC}$
$\overline{AX} \cong \overline{DX}$
Prove: $\Delta AXB \cong \Delta DXC$



Statements	Reasons
1. $\overline{AB} \parallel \overline{DC}$	1. Given
2. $\angle 1$ and $\angle 2$ are alt. int $\angle$s	2. Def of alt. int $\angle$s
3. $\angle 1 \cong \angle 2$	3. Alt. int $\angle$s Thm
4. $\overline{AX} \cong \overline{DX}$	4. Given
5. $\angle AXB$ and $\angle DXC$ are VA	5. Def. of V.A.
6. $\angle AXB \cong \angle DXC$	6. V.A. Thm
7. $\Delta AXB \cong \Delta DXC$	7. ASA Post.

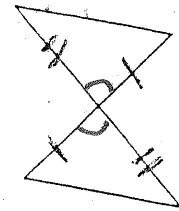
For each pair of triangles, tell if there is enough information to prove that the triangles are congruent. If so, explain: *ASA, AAS, SSS, SAS.* (NOTES)

1.



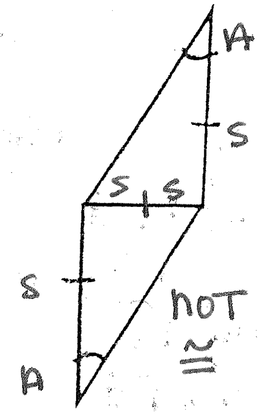
AAS.

2.



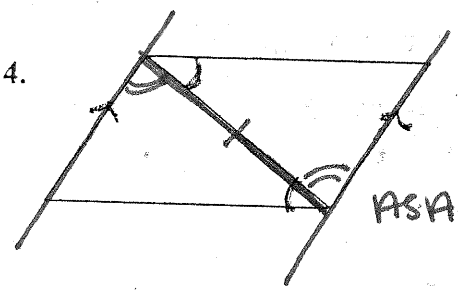
SAS

3.



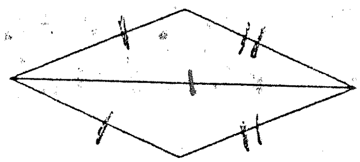
not ≅

4.



ASA.

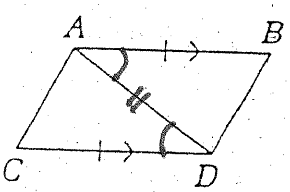
5.



SSS

- PROOFS - (EXAMPLE 2)

Given: $AB = CD$, $\overline{AB} \parallel \overline{CD}$
Prove: $\triangle ABD \cong \triangle$ DCA



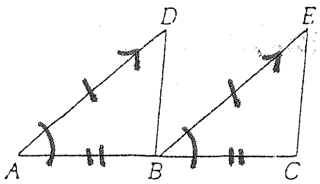
Statement	Justification
1. $AB = CD$	1. Given
2. $\overline{AB} \cong \overline{CD}$	2. Def. of cong seg.
3. $\overline{AD} \cong \overline{AD}$	3. Reflexive Prop. of ≅
4. $\overline{AB} \parallel \overline{CD}$	4. Given
5. $\angle BAD$ & $\angle CDA$ are alt int ∠s	5. Def of alt. int ∠s
6. $\angle BAD \cong \angle CDA$	6. alt. int ∠ Thm
7. $\triangle ABD \cong \triangle DCA$	7. SAS Post.

8. Given: $\overline{DB}$ bisects $\overline{AC}$.

$\overline{AD} \parallel \overline{BE}$

$\overline{AD} \cong \overline{BE}$

Prove: $\overline{DB} \cong \overline{EC}$ —CPCTC!



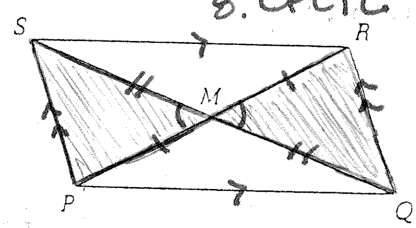
Prove: $\Delta ADB \cong \Delta BEC$ (1st)

Statements	Justifications
1. $\overline{AD} \cong \overline{BE}$	1. Given
2. $\overline{DB}$ bisects $\overline{AC}$	2. Given
3. $\overline{AB} \cong \overline{BC}$	3. Def. of bisector
4. $\overline{AD} \parallel \overline{BE}$	4. Given
5. $\angle DAB$ and $\angle EBC$ are corr $\angle$s	5. Def. of corr $\angle$s
6. $\angle DAB \cong \angle EBC$	6. Corr $\angle$s Post
7. $\Delta ADB \cong \Delta BEC$	7. SAS Post
*8. $\overline{DB} \cong \overline{EC}$	8. CPCTC

Given parallelogram $PQRS$

Diagonals PR and SQ bisect each other.

Prove $\triangle SMP \cong \triangle QMR$

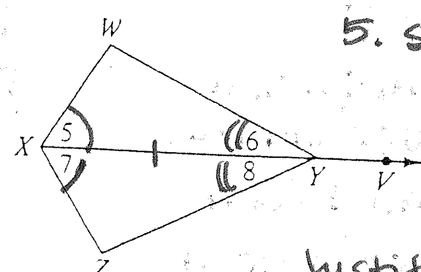


Statements	Justifications
1. $\overline{PR}$ and $\overline{SQ}$ bisect each other	1. Given
2. $\overline{SM} \cong \overline{QM}$, $\overline{PM} \cong \overline{RM}$	2. Def of bisector
3. $\angle SMP$ and $\angle QMR$ are V.A.	3. Def. of V.A.
4. $\angle SMP \cong \angle QMR$	4. V.A. Thm
5. $\Delta SMP \cong \Delta QMR$	5. SAS Post.

Given: $\overrightarrow{XY}$ bisects $\angle WXZ$;

$\overrightarrow{YX}$ bisects $\angle WYZ$.

Prove: $\triangle XWY \cong \triangle XZY$



Statements	Justifications
1. $\overrightarrow{XY}$ bisects $\angle WXZ$.	1. Given
2. $\angle 5 \cong \angle 7$	2. Def of ang. bisector
3. $\overrightarrow{YX}$ bisects $\angle WYZ$	3. Given
4. $\angle 6 \cong \angle 8$	4. Def of ang. bisector
5. $\overline{XY} \cong \overline{XY}$	5. Reflexive prop of $\cong$
6. $\Delta XWY \cong \Delta XZY$	6. ASA Post