Proving Triangles Congruent

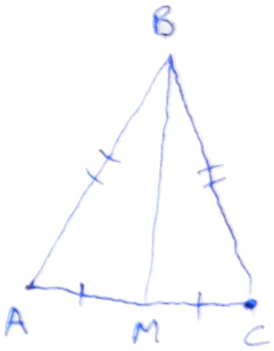
1. Given $\overline{BM} \perp \overline{AC}$, M is the midpoint of $\overline{AC}$

Prove: $\triangle ABM \cong \triangle CBM$

Statement	Reason
1. $\overline{BM} \perp \overline{AC}$, M is the midpoint of $\overline{AC}$	1. Given
2. $\overline{AM} \cong \overline{CM}$	2. By definition of midpoint
3. $\angle BMC = 90^\circ = \angle BMA$	3. By right angles are congruent to 90°, and $\overline{BM} \perp \overline{AC}$ means ~~If makes~~ $\overline{BM}$ creates a perpendicular to $\overline{AC}$
4. $\overline{BM} \cong \overline{BM}$	4. By the reflexive property
5. $\triangle ABM \cong \triangle CBM$	5. By ~~Reflexive~~ SAS ~~Property~~

2. Given: $\overline{AB} \cong \overline{BC}$; $\overline{MB}$ bisects $\overline{AC}$

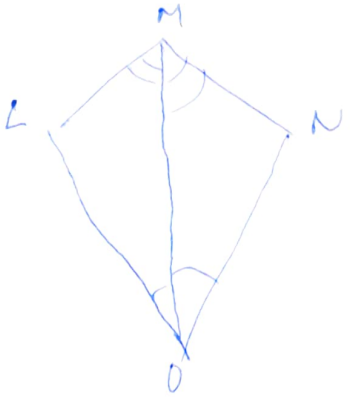
Prove: $\triangle ABM \cong \triangle CBM$



Statement	Reason
1. $\overline{AB} \cong \overline{BC}$; $\overline{MB}$ bisects $\overline{AC}$	1. Given
2. $\overline{AM} \cong \overline{MC}$	2. By definition of ~~Ray~~ segment bisector
3. $\overline{BM} \cong \overline{BM}$	3. Reflexive property
4. $\triangle ABM \cong \triangle CBM$	4 By SSS

3. Given: $\overline{MO}$ bisects $\angle LMN$ and $\angle LON$

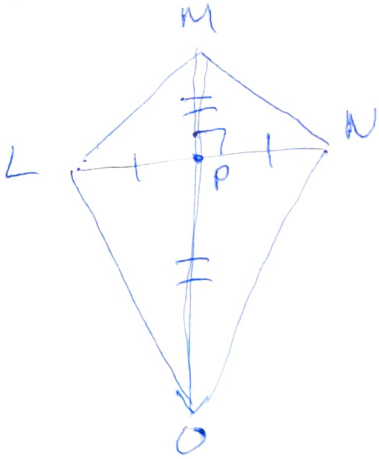
Prove: $\triangle MLO \cong \triangle MNO$



Statement	Reason
1. $\overline{MO}$ bisects $\angle LMN$ and $\angle LON$	1. Given
2. $\overline{MO} \cong \overline{MO}$	2. Reflexive property
3. $\angle LMO \cong \angle NMO$, $\angle LOM \cong NOM$	3. By definition of angle bisector
4. $\triangle MLO \cong \triangle MNO$	4. By ASA

4. Given: $\overline{LN}$ intersects $\overline{MO}$ at point P, $\overline{MO}$ is the perpendicular bisector of $\overline{LN}$

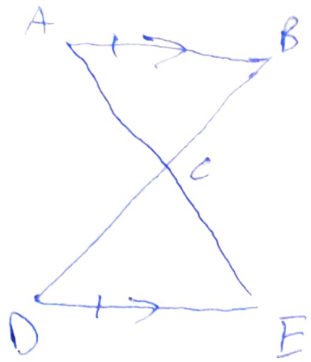
Prove: $\triangle MLP \cong \triangle MNP$



Statement	Reason
1. $\overline{LN}$ intersects $\overline{MO}$ at point P, $\overline{MO}$ is the perpendicular bisector of $\overline{LN}$	1. Given
2. $\angle LPM \cong \angle NPM \cong 90°$	2. Perpendicular bisectors create right angles
3. $\overline{LP} \cong \overline{PN}$	3. Perpendicular bisectors are line segment bisectors,
4. $\overline{MP} \cong \overline{MP}$	4. Reflexive property
5. $\triangle MLP \cong \triangle MNP$	5 By SAS

5. Given: $\overline{AB} \parallel \overline{DE}$; $\overline{AB} \cong \overline{DE}$

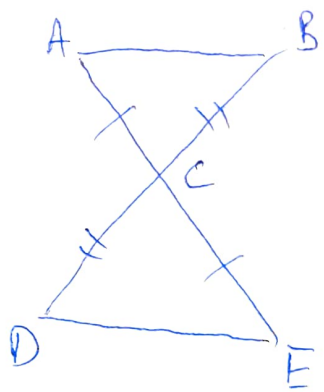
Prove: $\triangle ABC \cong \triangle EDC$



Statement	Reason
1. $\overline{AB} \parallel \overline{DE}$; $\overline{AB} \cong \overline{DE}$	1. Given
2. $\angle CED \cong \angle CAB$	2. Alternate interior angles are congruent
3. $\angle ACB \cong \angle DCE$	3. Vertical angles are congruent
4. $\triangle ABC \cong \triangle EDC$	4. By AAS

6. Given: $\overline{AE}$ and $\overline{BD}$ bisect each other at C

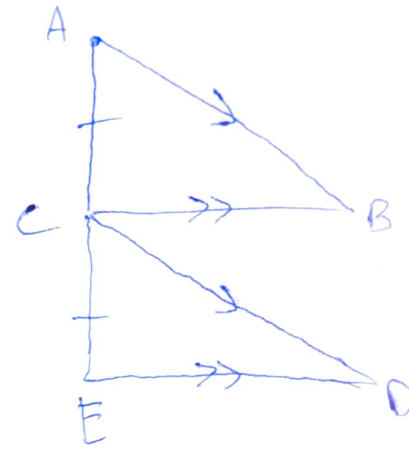
Prove: $\triangle ABC \cong \triangle EDC$



Statement	Reason
1. $\overline{AE}$ and $\overline{BD}$ bisect each other at C	1. Given
2. $\overline{AC} \cong \overline{CE}$ $\overline{BC} \cong \overline{CD}$	2. Definition of segment bisector
3. $\angle ACB \cong \angle DCE$	3. Vertical angles are congruent
4. $\triangle ABC \cong \triangle EDC$	4. By SAS

7. Given: $\overline{AB} \parallel \overline{CD}$; $\overline{BC} \parallel \overline{DE}$, C is the midpoint of $\overline{AE}$

Prove: $\triangle ABC \cong \triangle CDE$



Statement	Reason
1. $\overline{AB} \parallel \overline{CD}$, $\overline{BC} \parallel \overline{DE}$, C is the midpoint of $\overline{AE}$	1. Given
2. $\overline{AC} \cong \overline{CE}$	2. By definition of midpoint
3. $\angle ACB \cong \angle CED$ $\angle CAB \cong \angle ECD$	3. Corresponding angles are congruent
4. $\triangle ABC \cong \triangle CDE$	4. By ASA