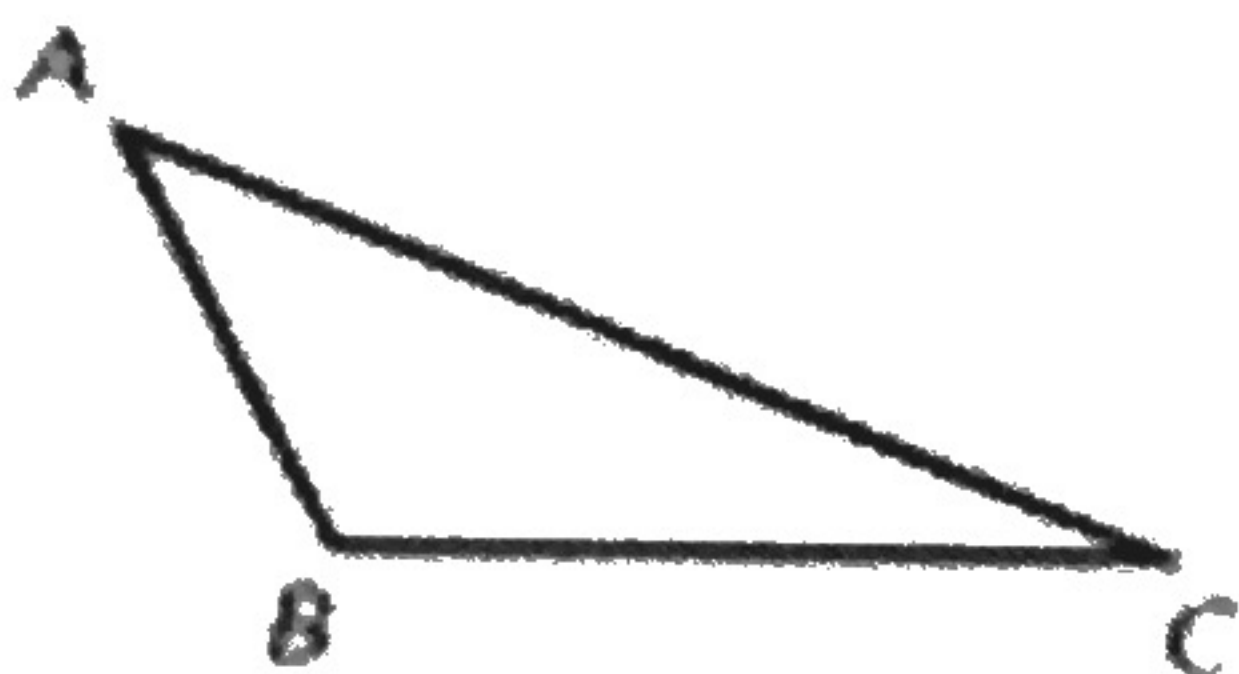


Unit 4: Congruent Triangles Study Guide

4.1 Angles of Triangles

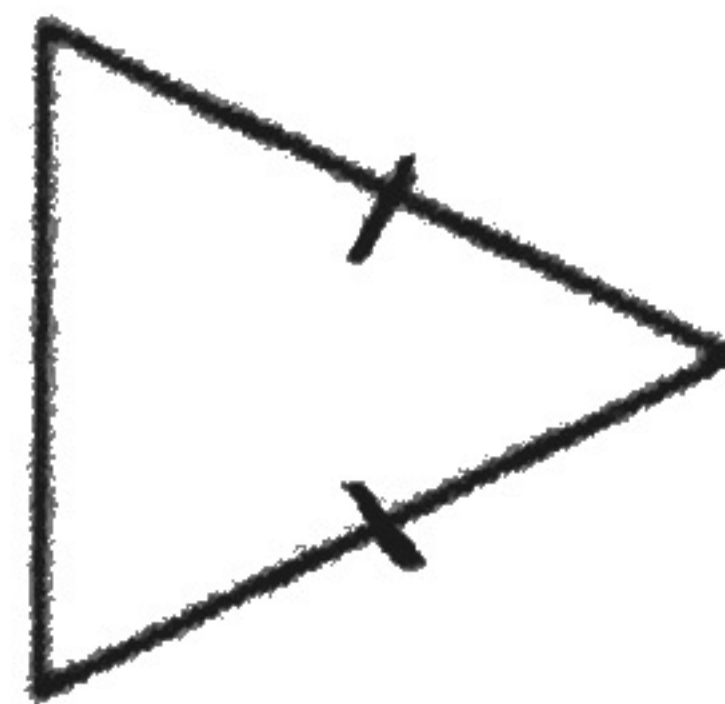
Classify the triangle by its sides and by measuring its angles.

1.



obtuse scalene

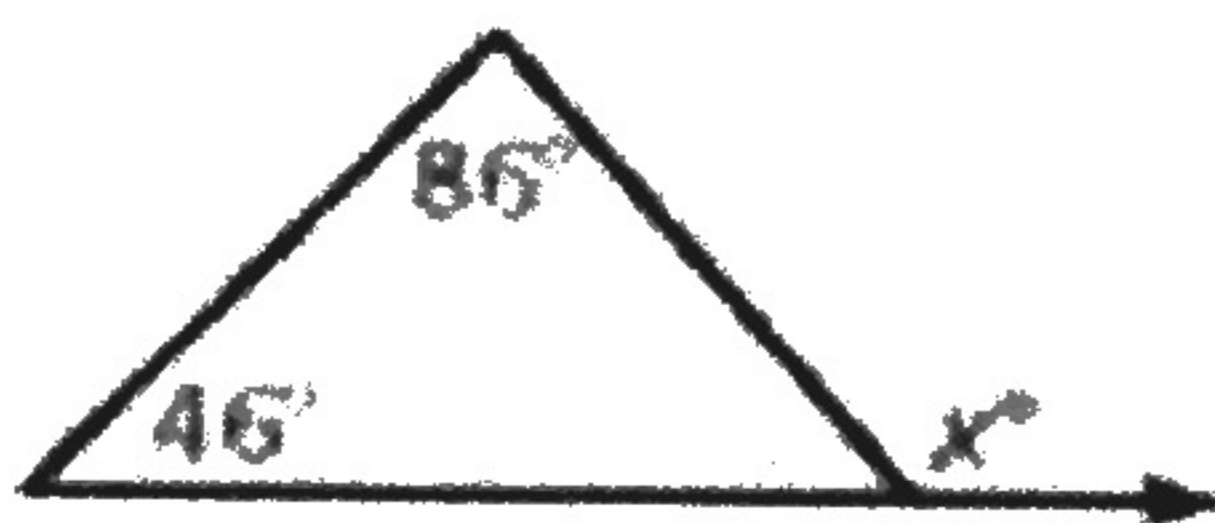
2.



acute isosceles

Find the measure of the exterior angle.

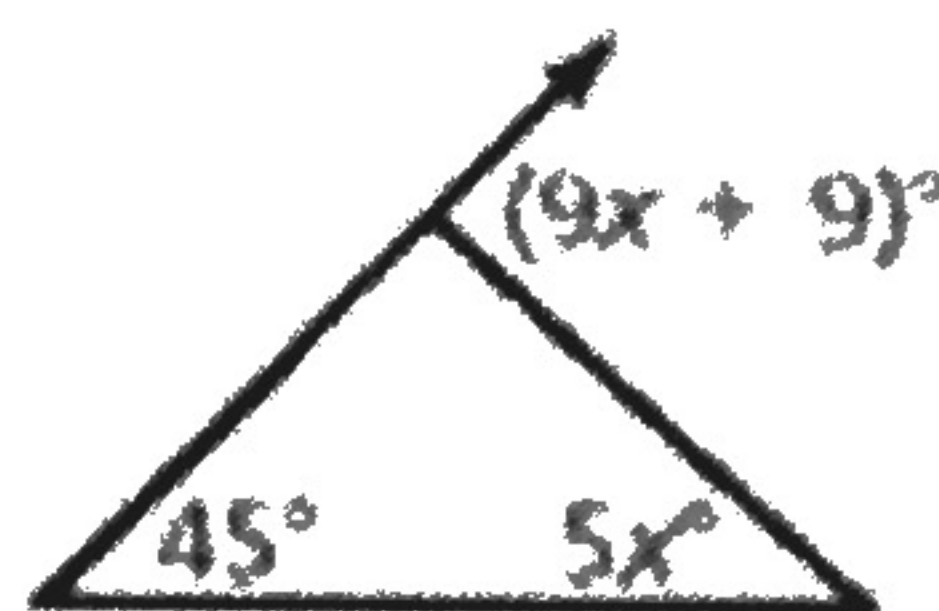
3.



$$x = 46 + 86$$

$$x = 132^\circ$$

4.



$$9x + 9 = 45 + 5x$$

$$4x + 9 = 45$$

$$4x = 36$$

$$x = 9$$

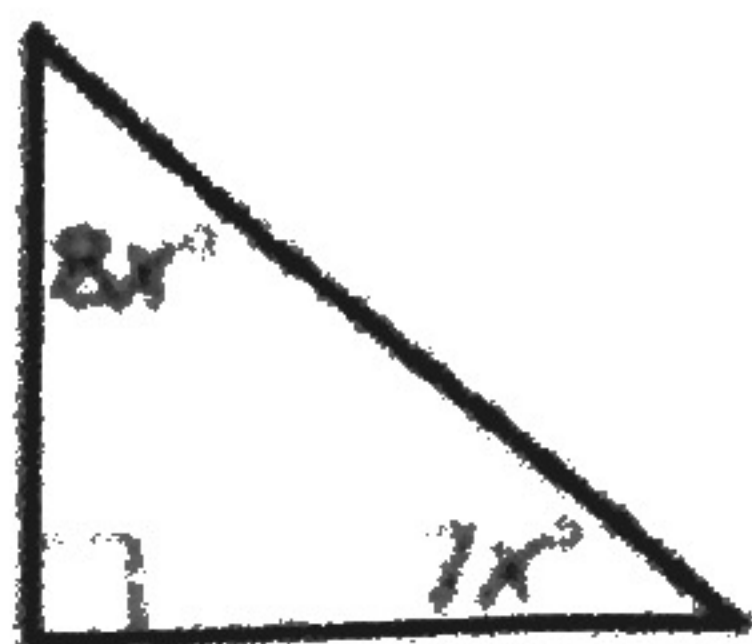
$$9(9) + 9$$

$$81 + 9$$

$$90^\circ$$

Find the measure of each acute angle.

5.



$$8x + 7x = 90$$

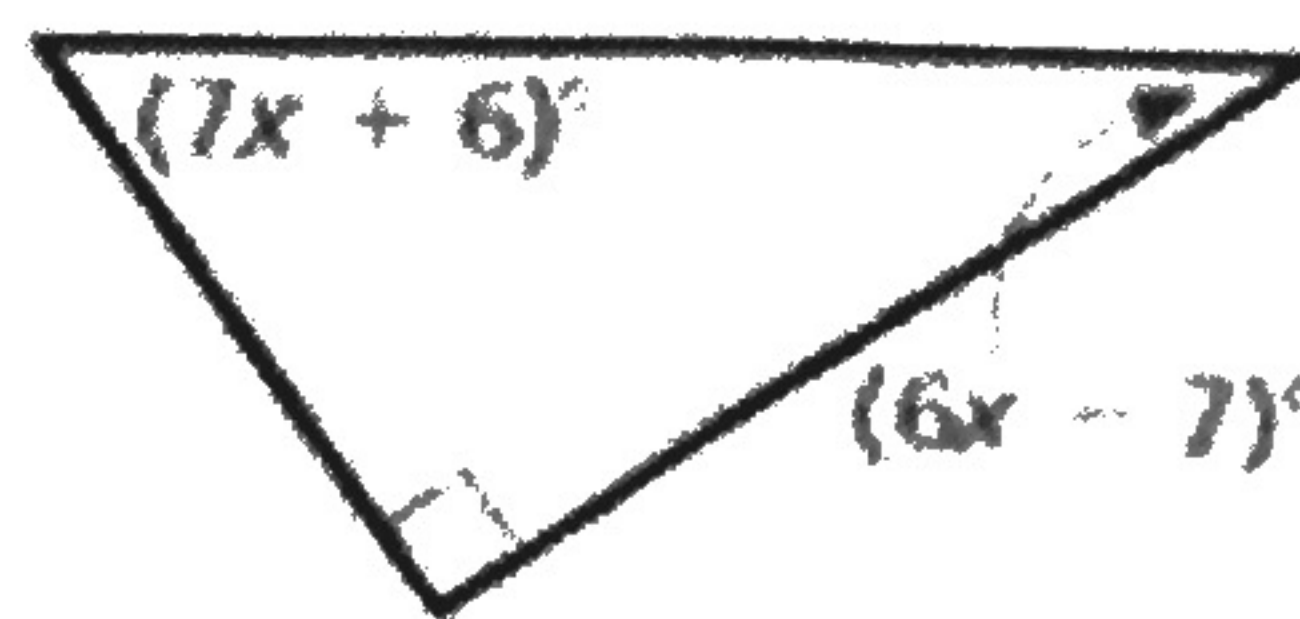
$$15x = 90$$

$$x = 6$$

$$7x = 7(6) = 42^\circ$$

$$8x = 8(6) = 48^\circ$$

6.



$$7x + 6 + 6x - 7 = 90$$

$$13x - 1 = 90$$

$$13x = 91$$

$$x = 7$$

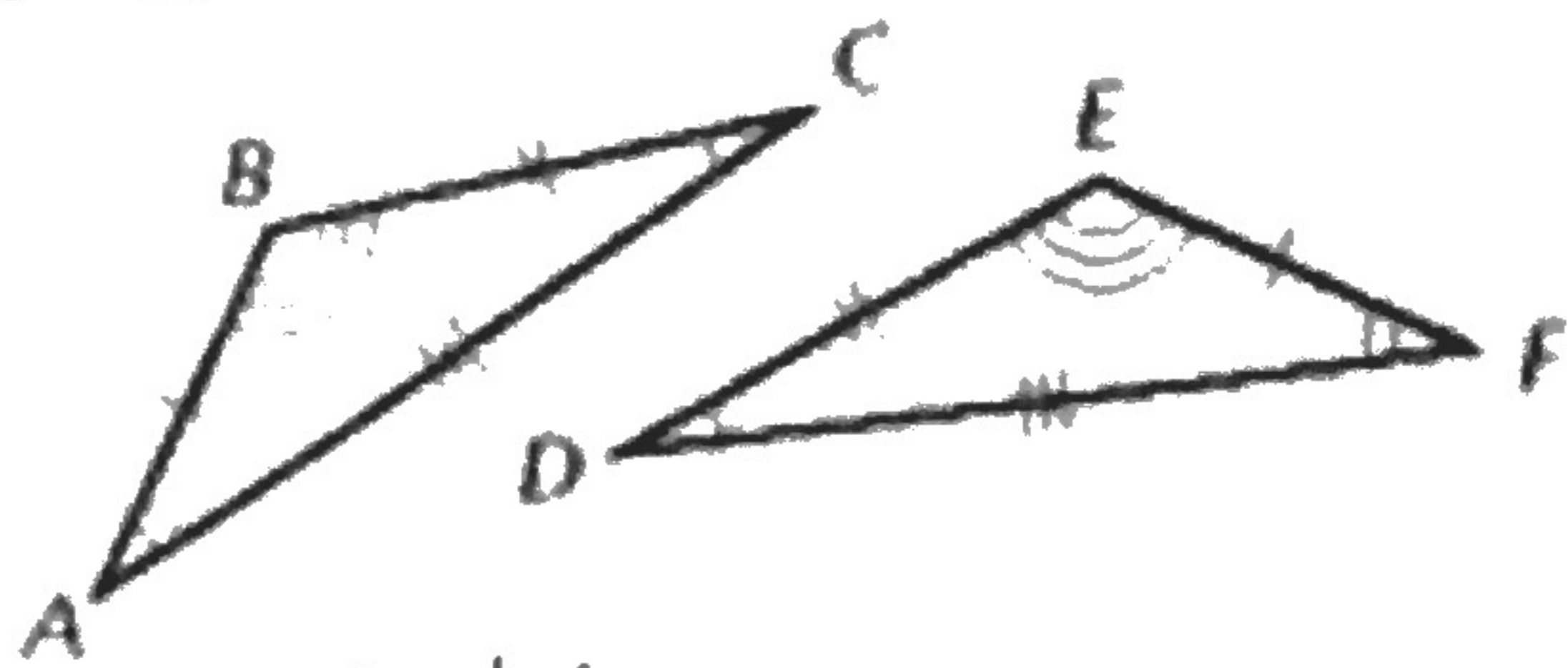
$$7x + 6 = 7(7) + 6 = 55^\circ$$

$$6x - 7 = 6(7) - 7 = 35^\circ$$

4.2 Congruent Polygons

Identify all pairs of congruent corresponding parts. Then write a congruence statement for the polygons.

7.

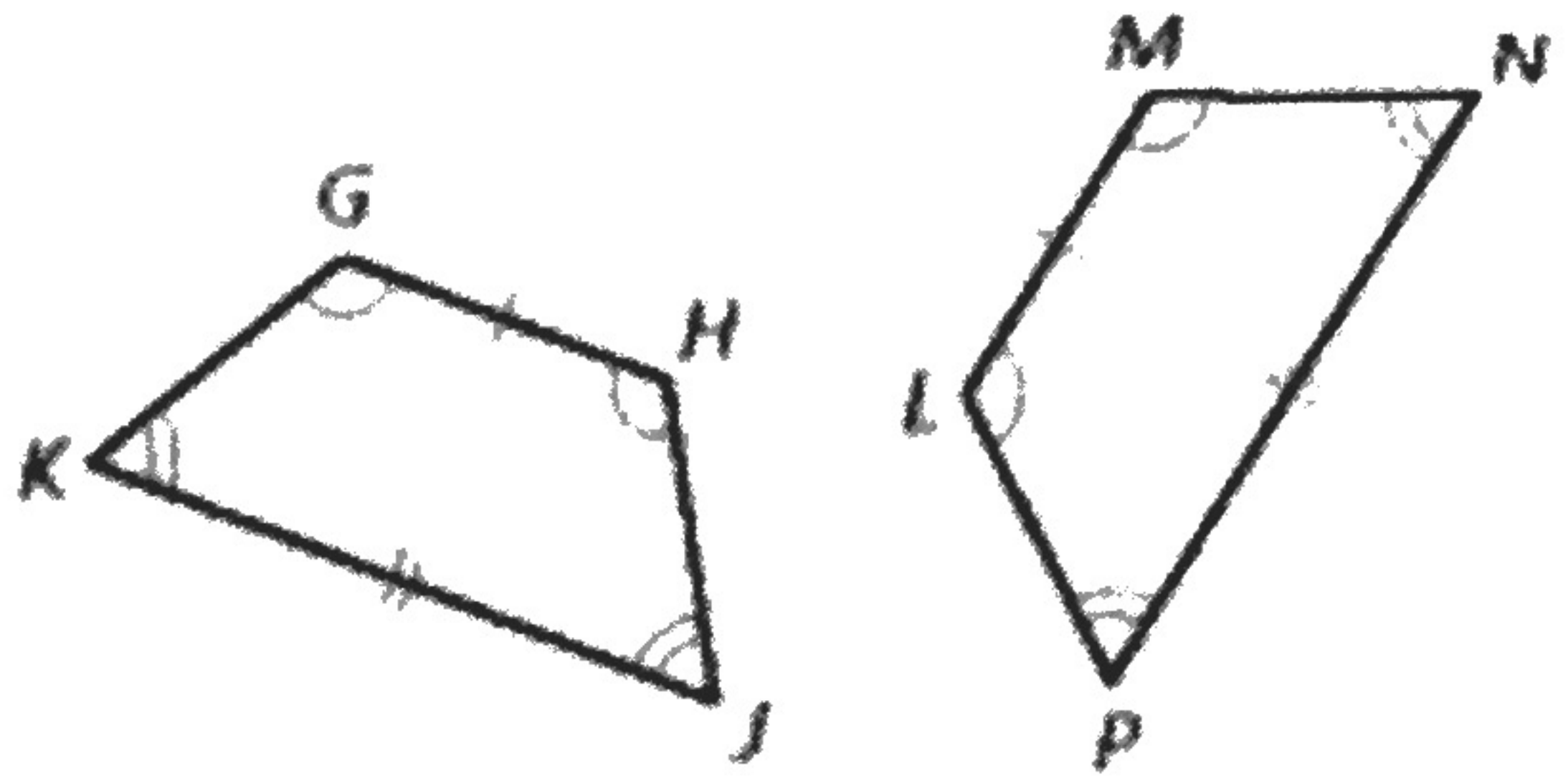


Sides
 $\overline{AB} \cong \overline{FE}$
 $\overline{BC} \cong \overline{ED}$
 $\overline{AC} \cong \overline{FD}$

Angles
 $\angle A \cong \angle F$
 $\angle B \cong \angle E$
 $\angle C \cong \angle D$

$\triangle ABC \cong \triangle FED$

8.

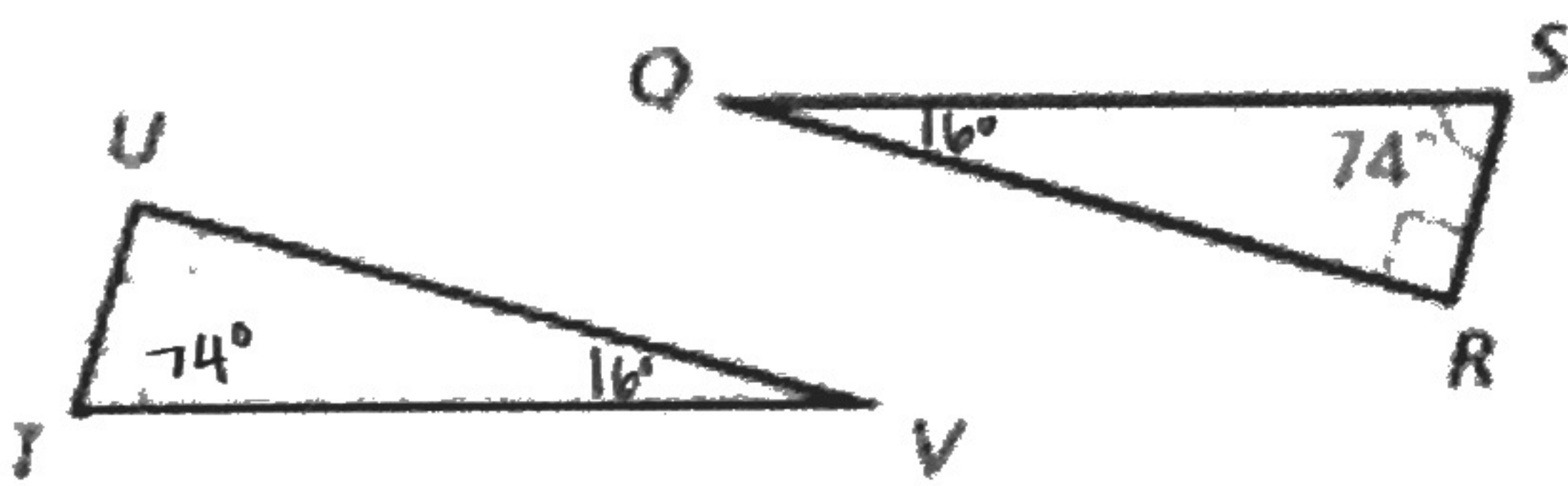


sides
 $\overline{GK} \cong \overline{LP}$
 $\overline{GH} \cong \overline{LM}$
 $\overline{HI} \cong \overline{MN}$
 $\overline{KJ} \cong \overline{PN}$

angles
 $\angle G \cong \angle L$
 $\angle H \cong \angle M$
 $\angle I \cong \angle N$
 $\angle J \cong \angle P$

$GHIK \cong LMNP$

9. Find $m\angle V$.



$74 + m\angle V = 90$

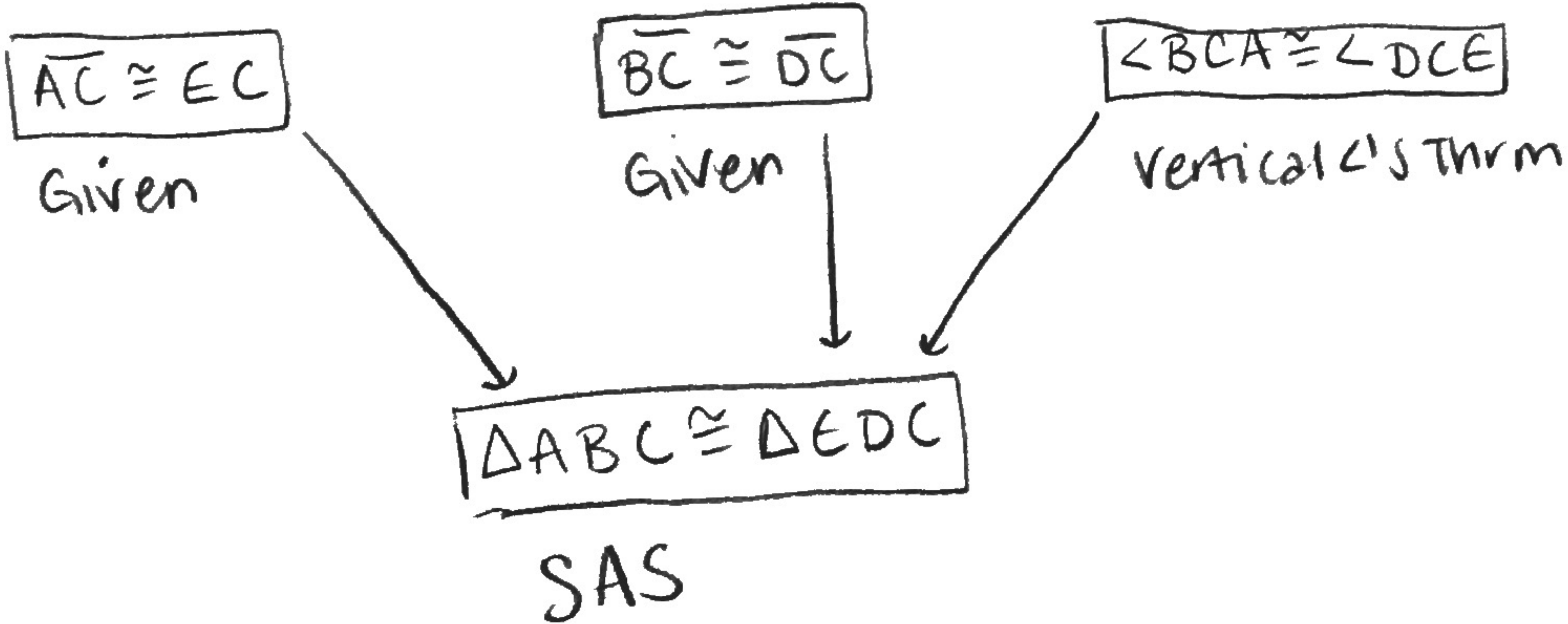
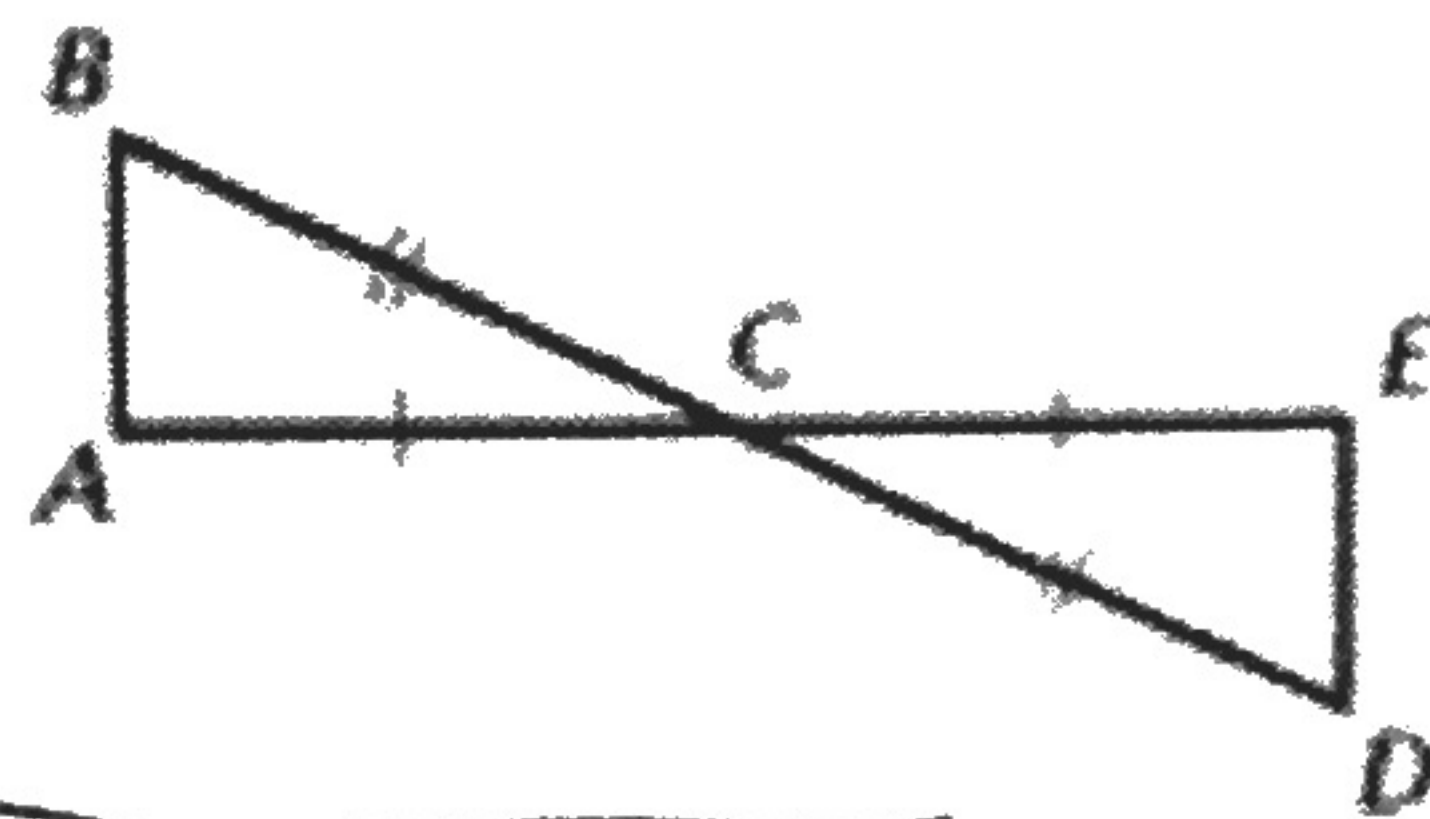
$m\angle V = 16^\circ$

4.3 Proving Triangle Congruence by SAS

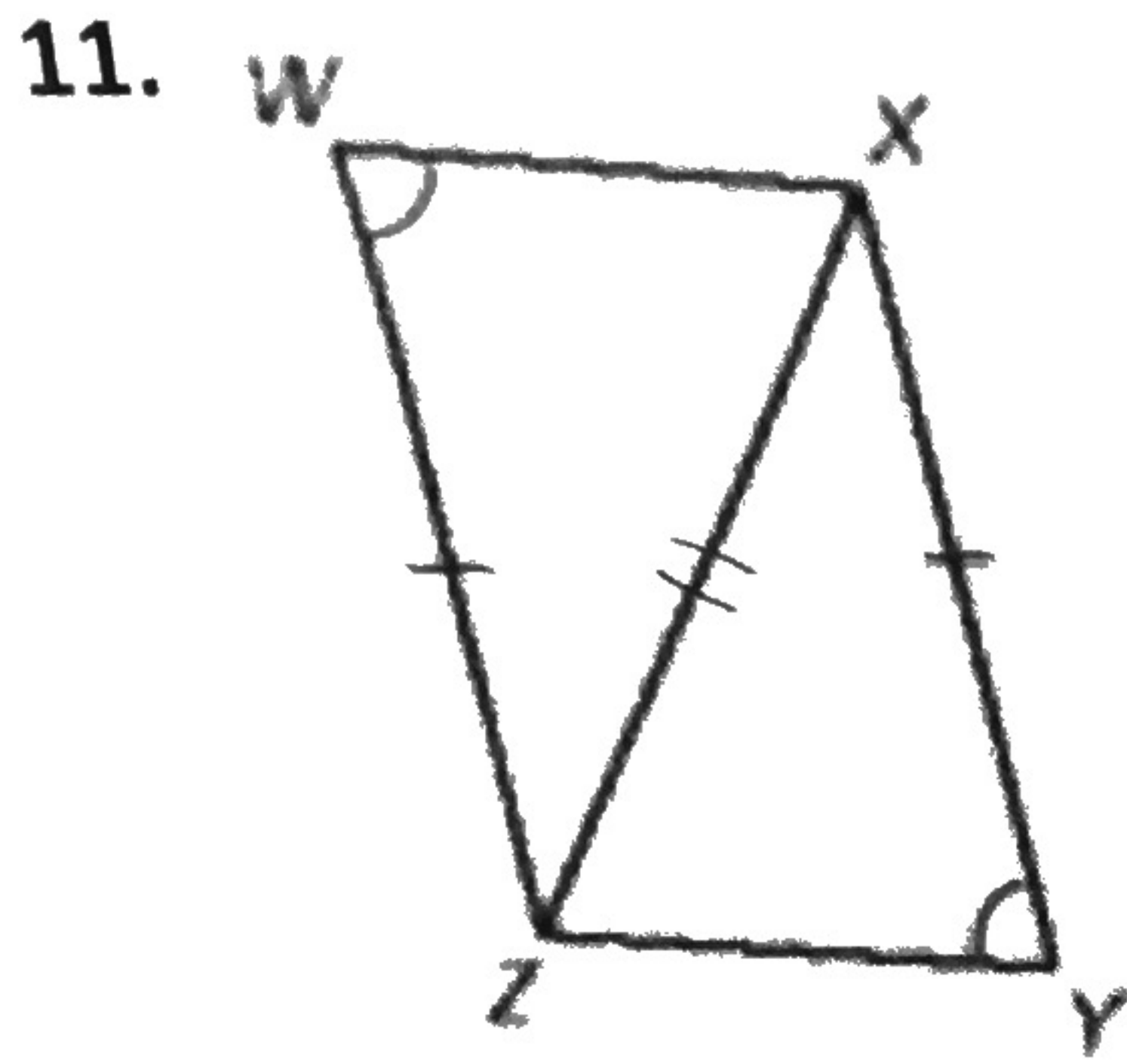
10. Write a proof.

Given: $\overline{AC} \cong \overline{EC}$, $\overline{BC} \cong \overline{DC}$

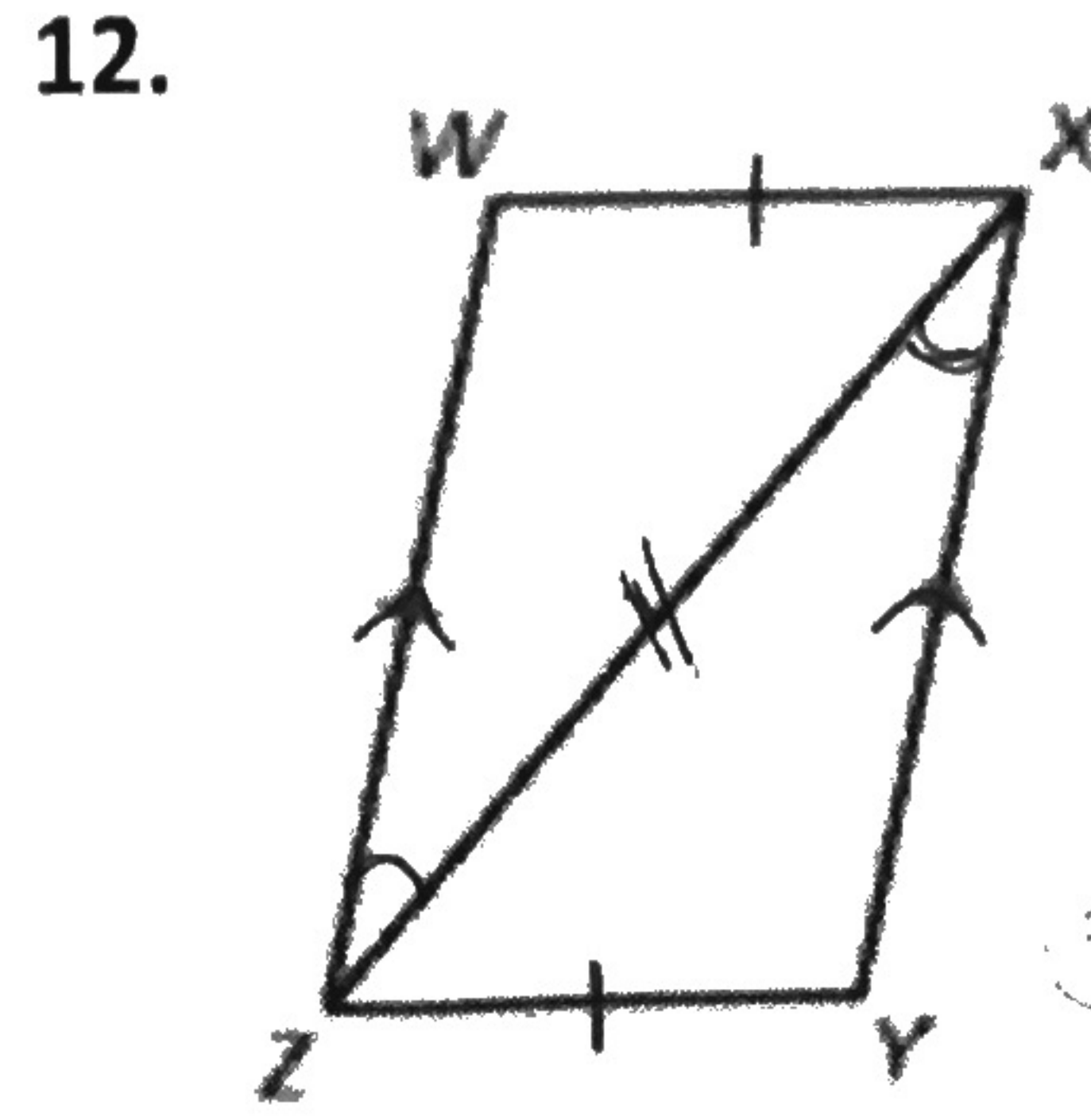
Prove: $\triangle ABC \cong \triangle EDC$



Decide whether enough information is given to prove that $\triangle WXZ \cong \triangle YZX$ using the SAS Congruence Theorem. If so, write a proof. If not, explain why.



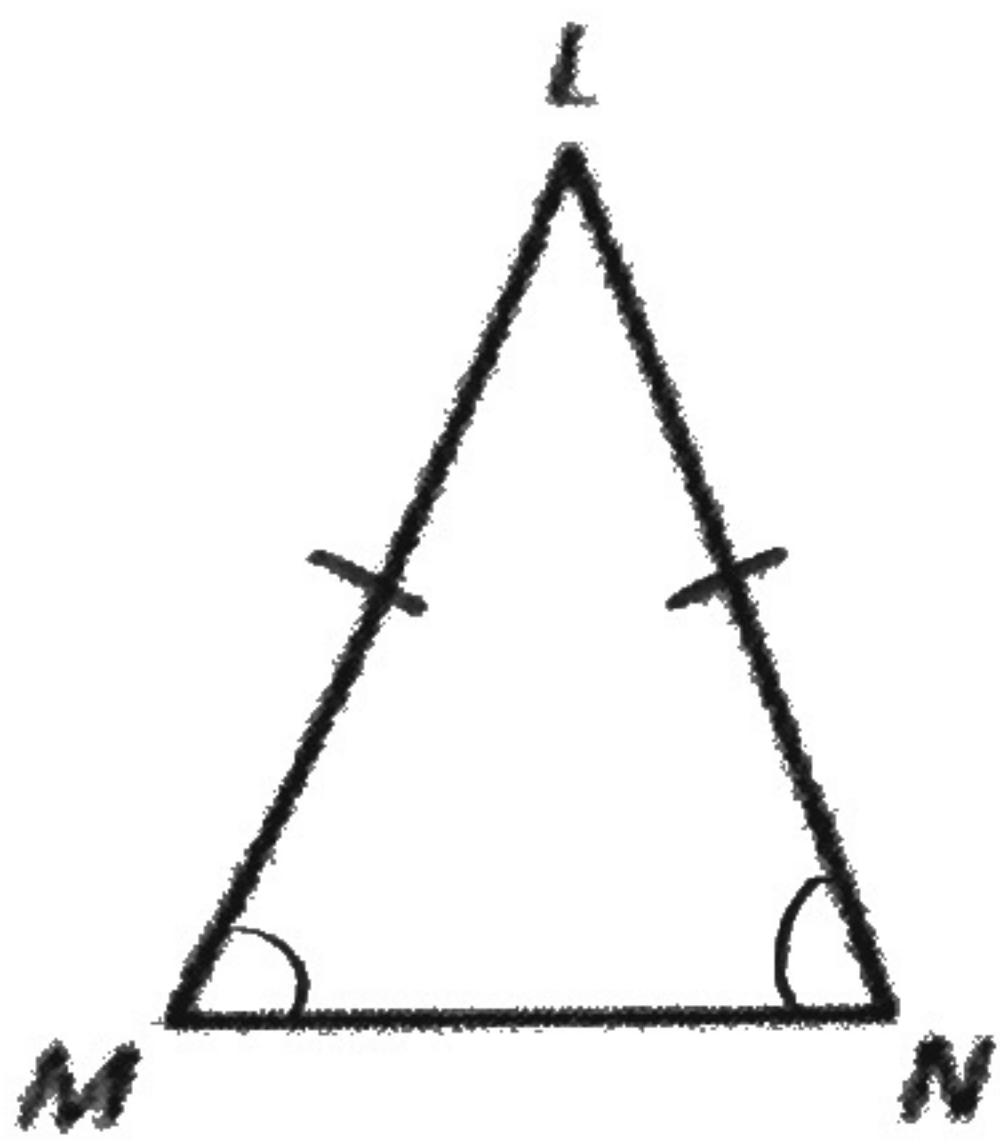
Not enough information.
(no SSA theorem)



Not enough information.
(no SSA theorem)

5.4 Equilateral and Isosceles Triangles

13. In $\triangle LMN$, $\overline{LM} \cong \overline{LN}$. Name two congruent angles.



$\angle M \cong \angle N$

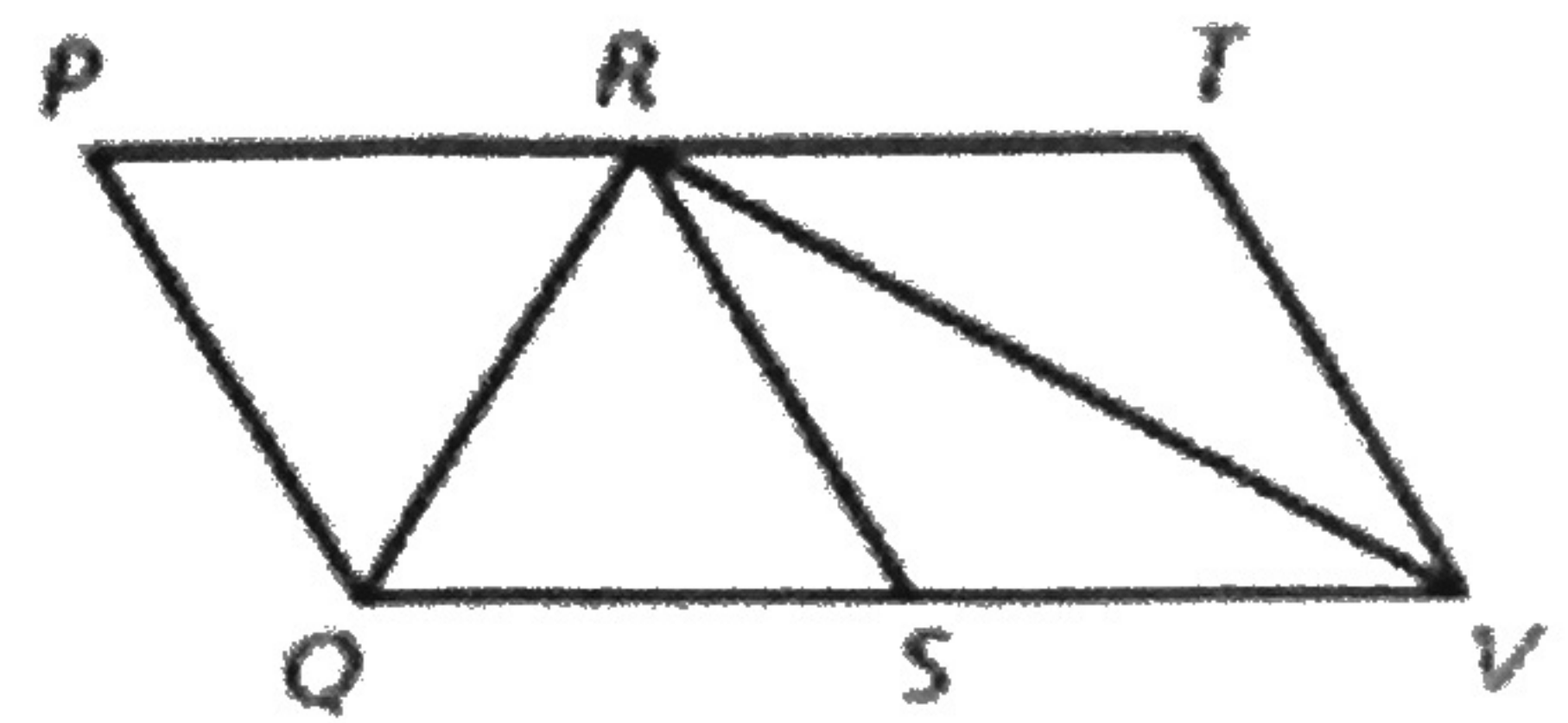
Complete the statement.

14. If $\overline{QP} \cong \overline{QR}$, then $\angle \underline{P} \cong \angle \underline{R}$.

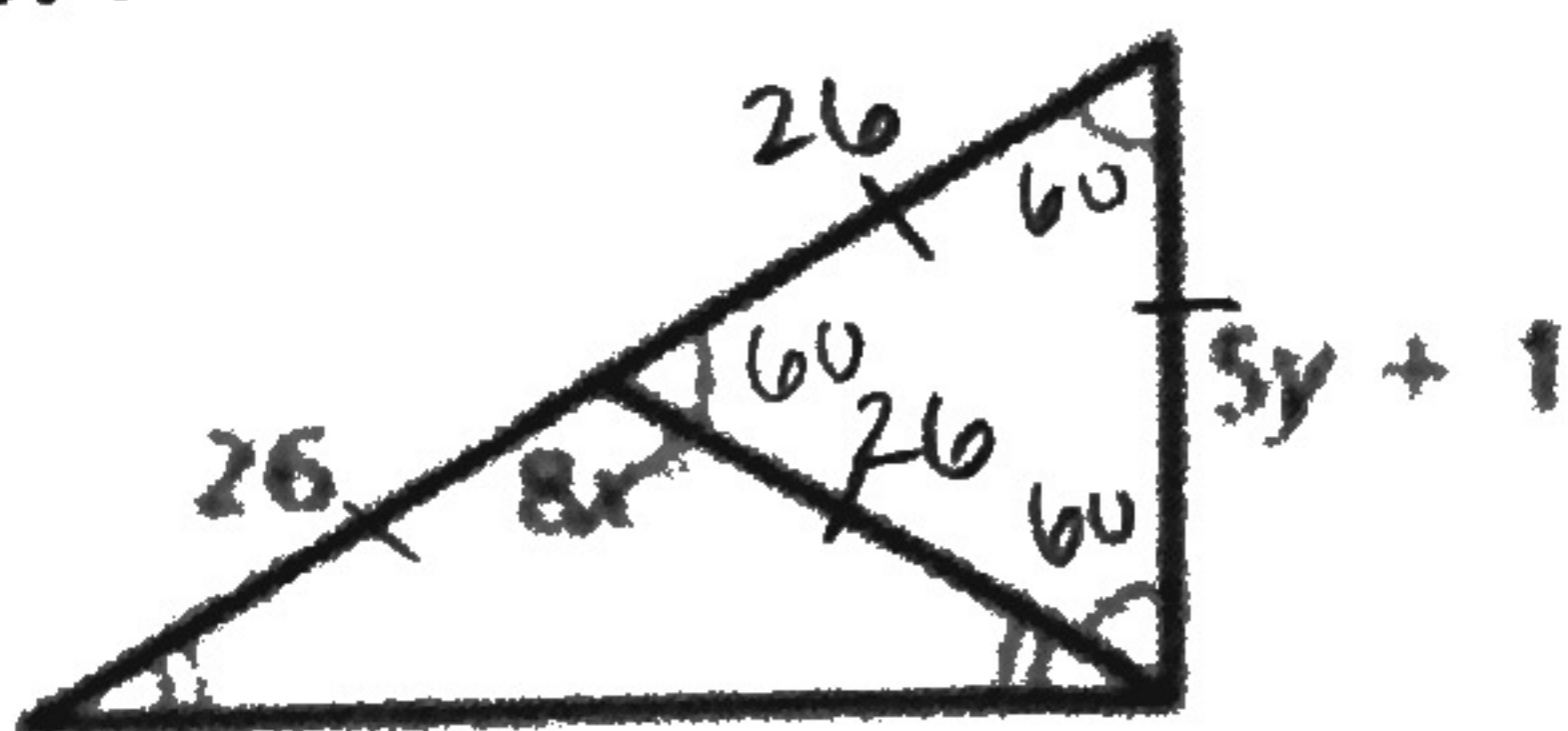
15. If $\angle TRV \cong \angle TVR$, then $\underline{\overline{TR}} \cong \underline{\overline{TV}}$.

16. If $\overline{RQ} \cong \overline{RS}$, then $\angle \underline{Q} \cong \angle \underline{S}$.

17. If $\angle SRV \cong \angle SVR$ then $\underline{\overline{SR}} \cong \underline{\overline{SV}}$.



18. Find the values of x and y in the diagram.



$5y + 1 = 26$

$5y = 25$

$y = 5$

$8x + 60 = 180$

$8x = 120$

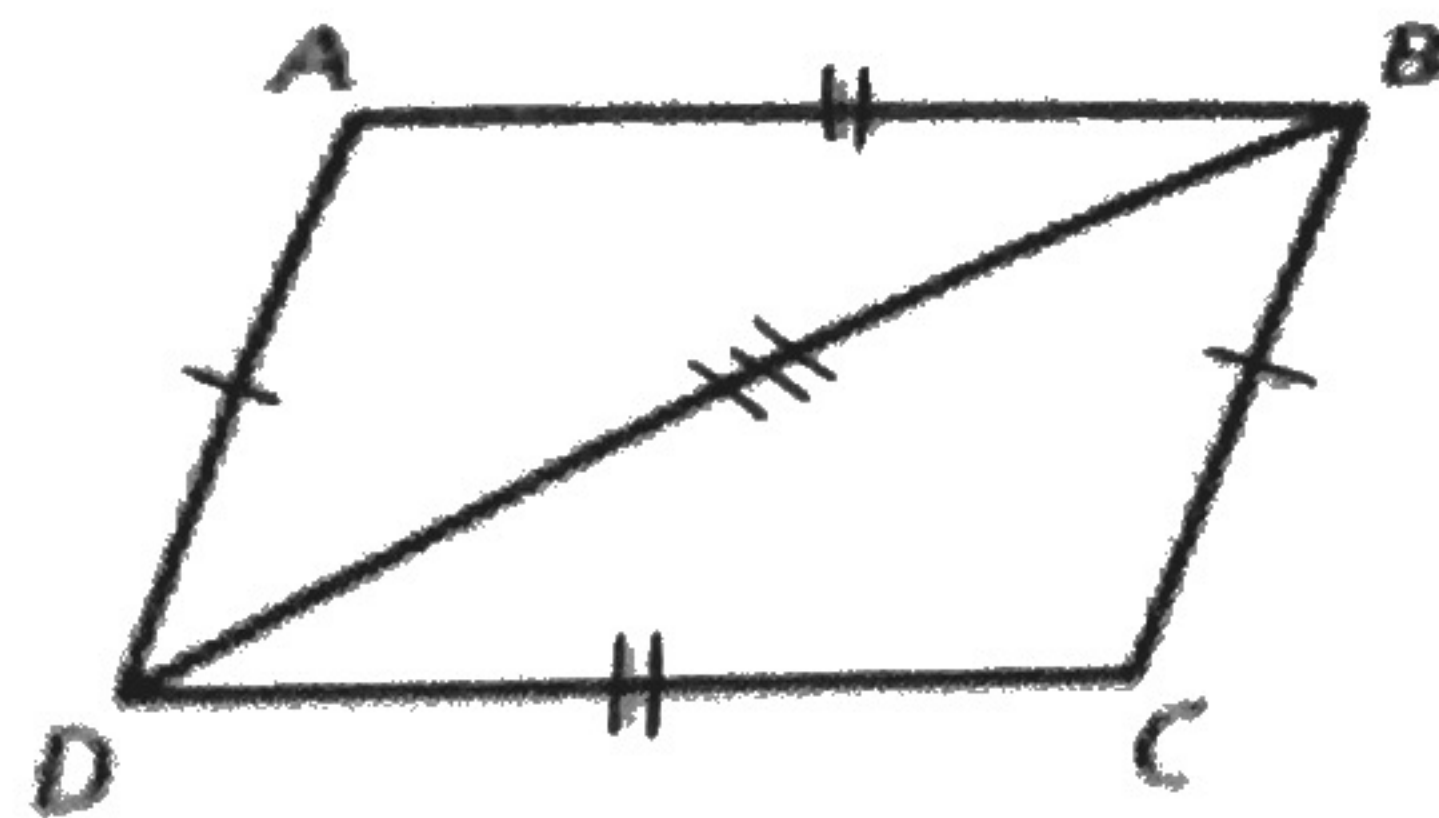
$x = 15$

4.5 Proving Triangles Congruence by SSS

19. Write a proof.

Given: $\overline{AD} \cong \overline{CB}$, $\overline{AB} \cong \overline{CD}$

Prove: $\triangle ABD \cong \triangle CDB$



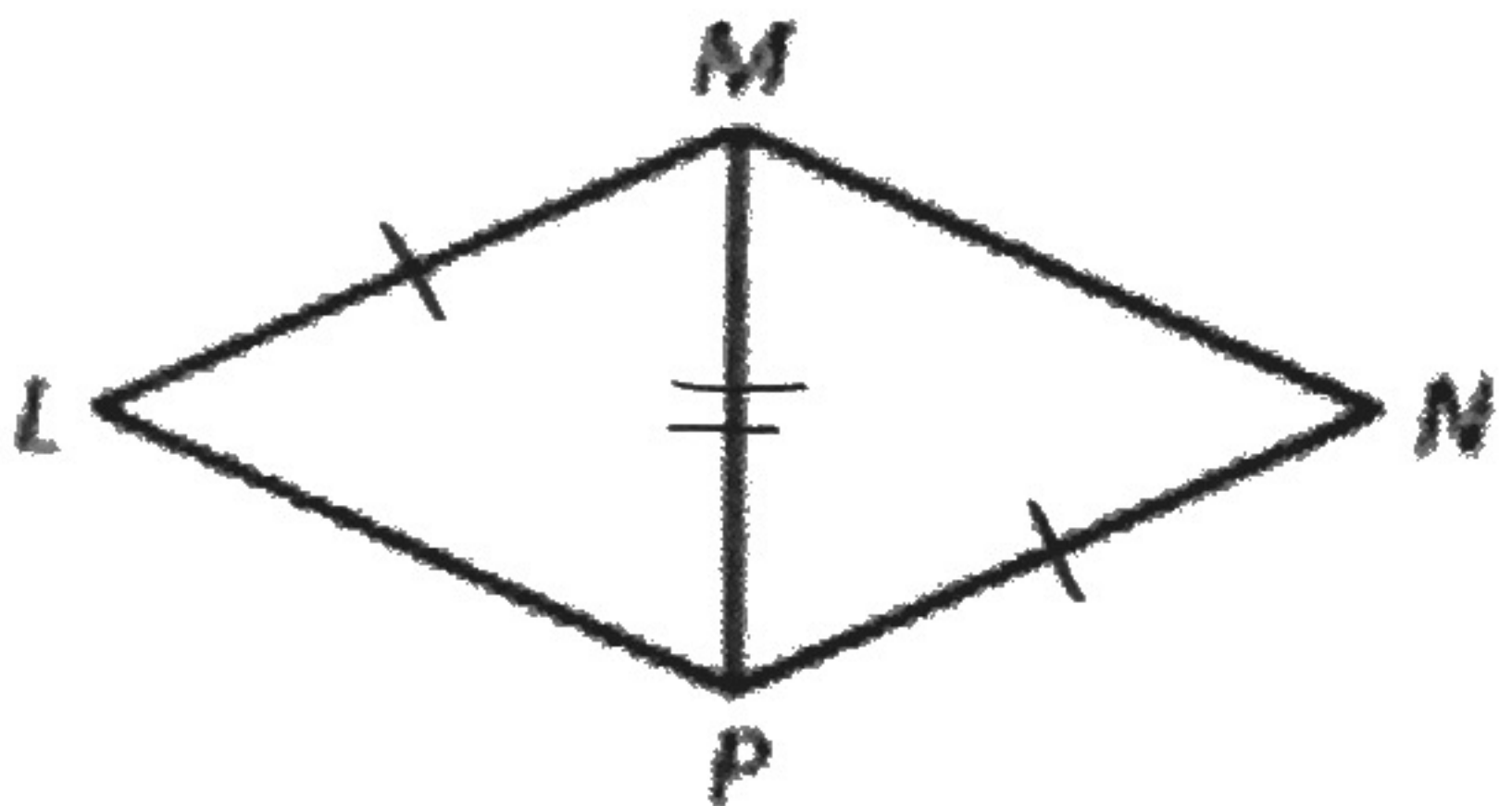
$\overline{AD} \cong \overline{CB}$
Given

$\overline{AB} \cong \overline{CD}$
Given

$\overline{BD} \cong \overline{DB}$
Reflexive Prop. of \cong

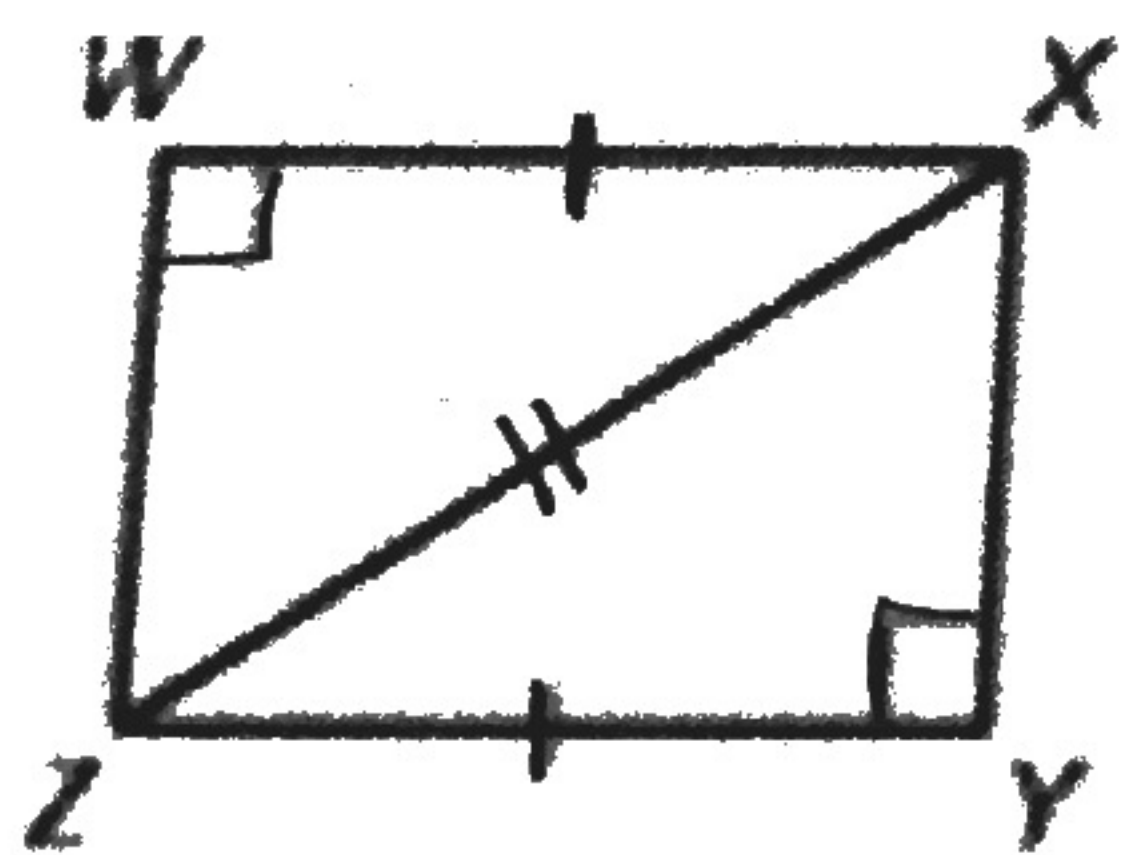
$\triangle ABD \cong \triangle CDB$
SSS

20. Decide whether enough information is given to prove that $\triangle LMP \cong \triangle NPM$ using the SSS Congruence Theorem. If so, write a proof. If not, explain why.



Not enough information
(Need $\overline{LP} \cong \overline{NM}$)

21. Decide whether enough information is given to prove that $\triangle WXZ \cong \triangle YZX$ using the HL Congruence Theorem. If so, write a proof. If not, explain why.



$\overline{WX} \cong \overline{YZ}$
Given

$\angle W$ and $\angle Y$ are right angles
Given

$\overline{ZX} \cong \overline{XZ}$
Reflexive Prop. of \cong

$\triangle WXZ$ and $\triangle YZX$ are right triangles
Def. of right \triangle

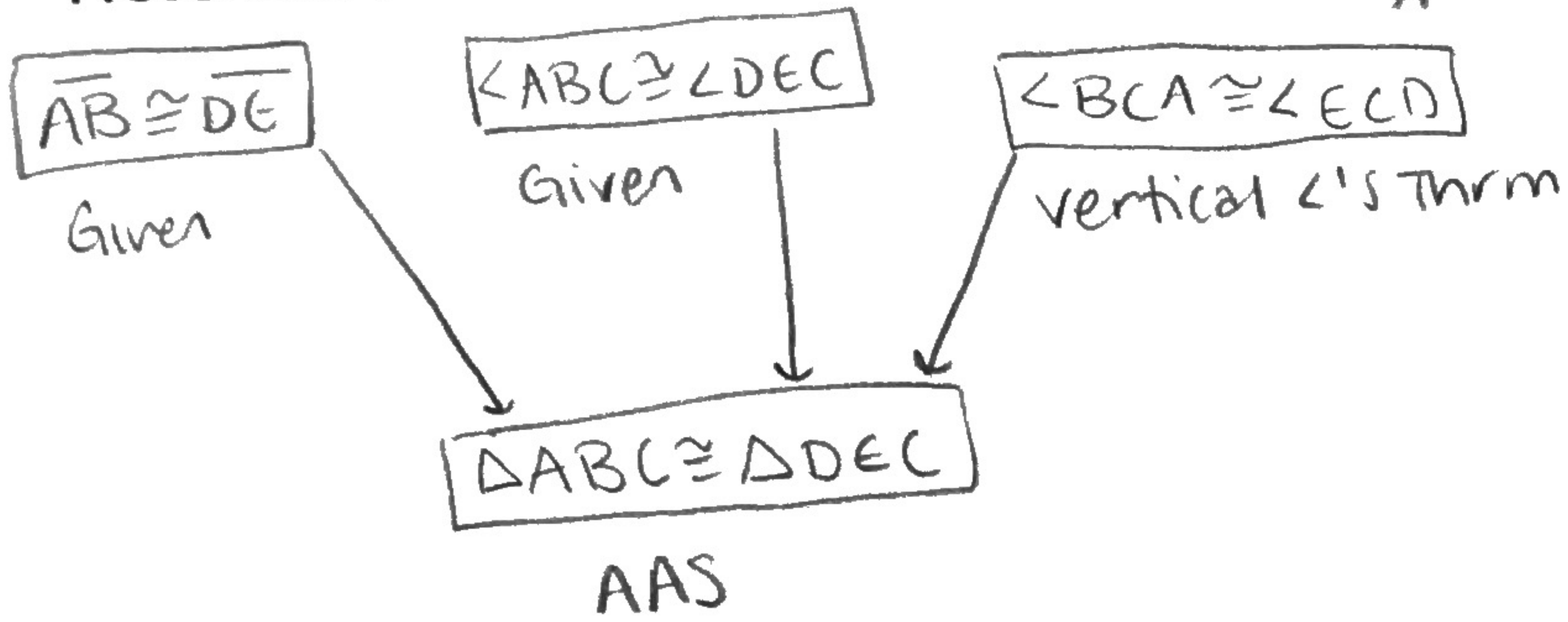
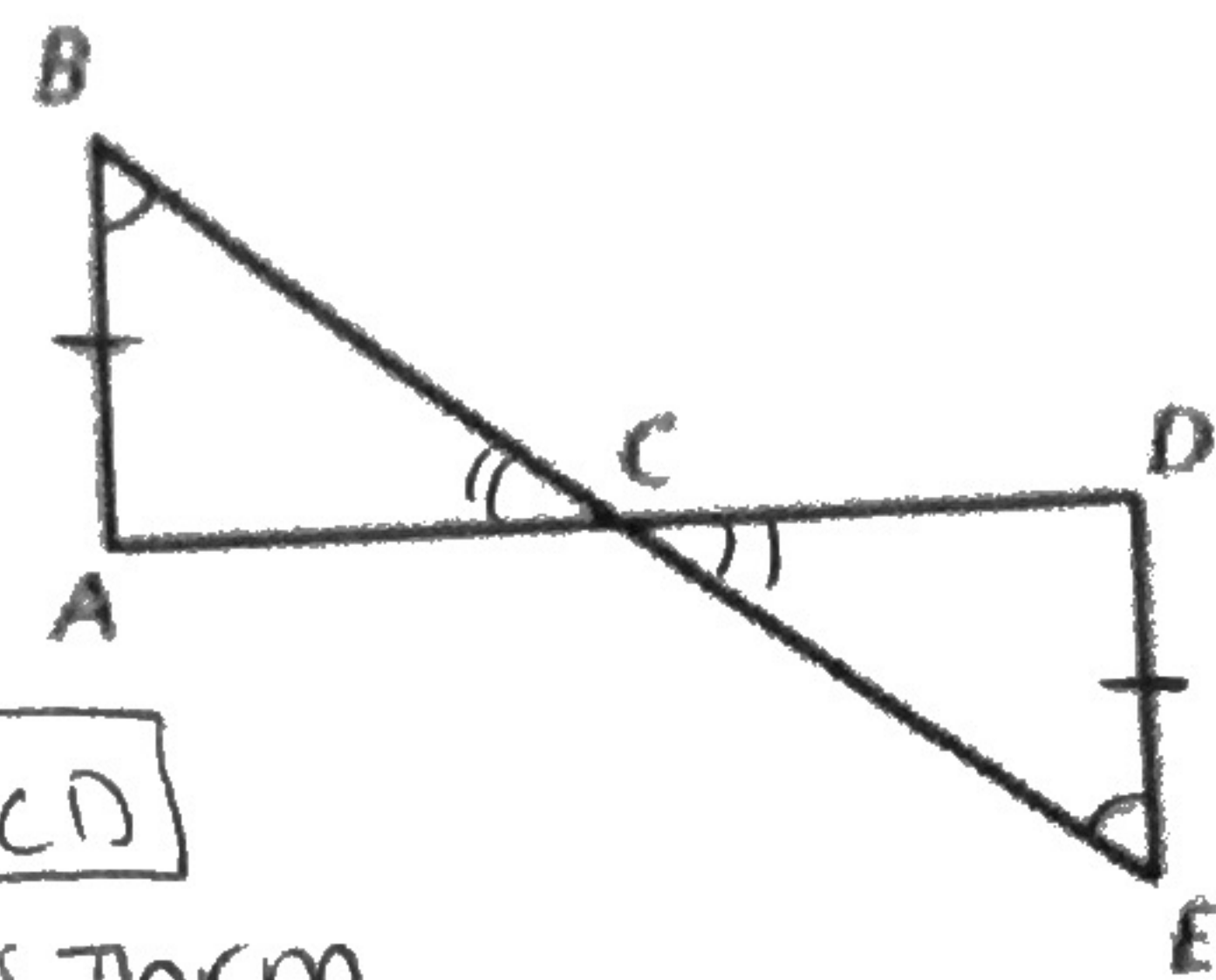
$\triangle WXZ \cong \triangle YZX$
HL

4.6 Proving Triangle Congruence by ASA and AAS

22. Write a proof.

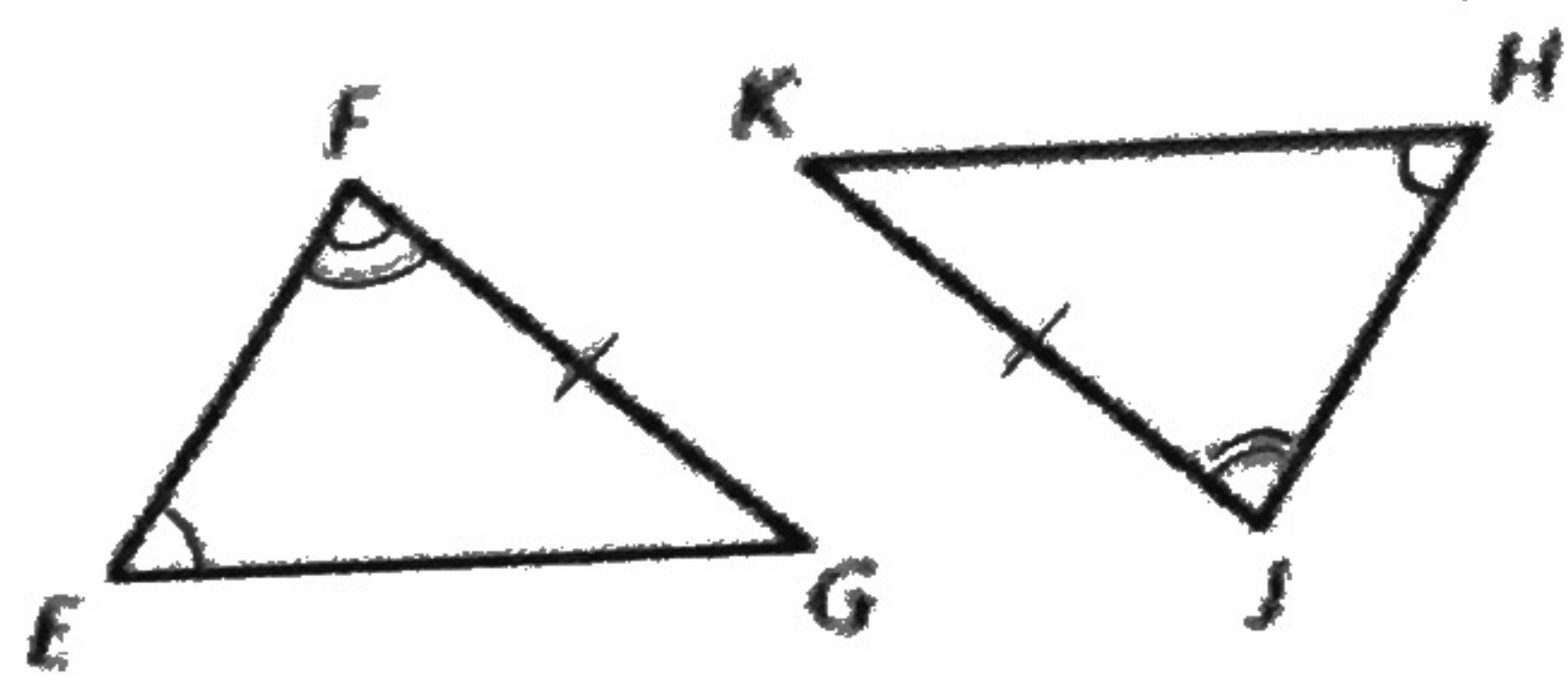
Given: $\overline{AB} \cong \overline{DE}$, $\angle ABC \cong \angle DEC$

Prove: $\triangle ABC \cong \triangle DEC$



Decide whether enough information is given to prove that the triangles are congruent using the AAS Congruence Theorem. If so, write a proof. If not, explain why.

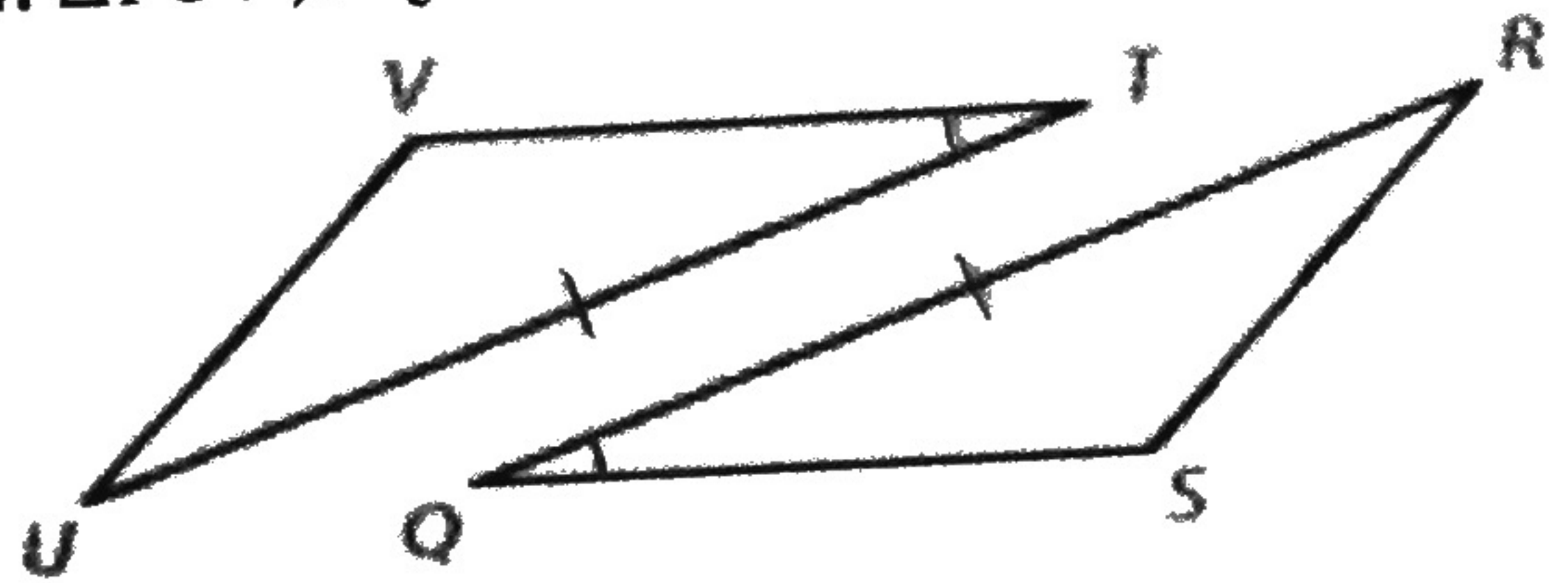
23. $\triangle EFG, \triangle HJK$



Yes, all information is given to prove AAS.

($\angle E \cong \angle H$, $\angle F \cong \angle J$, $\overline{FG} \cong \overline{JK}$)

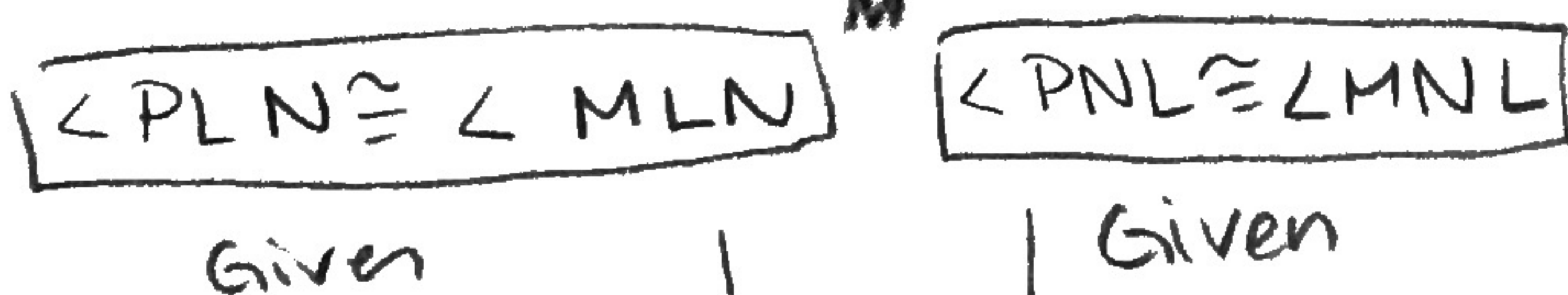
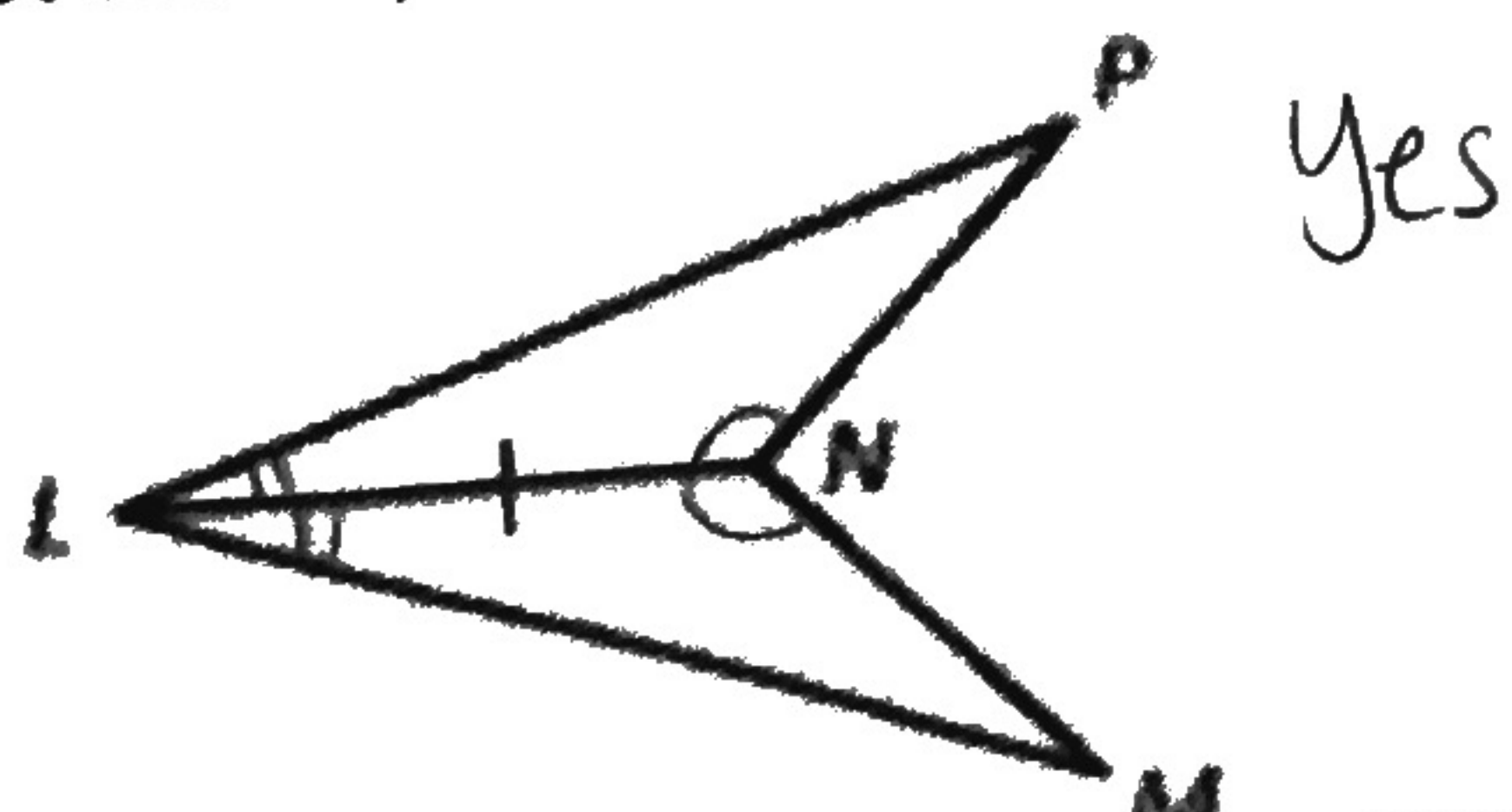
24. $\triangle TUV, \triangle QRS$



Not enough information (need one more angle)

Decide whether enough information is given to prove that the triangles are congruent using the ASA Congruence Theorem. If so, write a proof. If not, explain why.

25. $\triangle LPN, \triangle LMN$

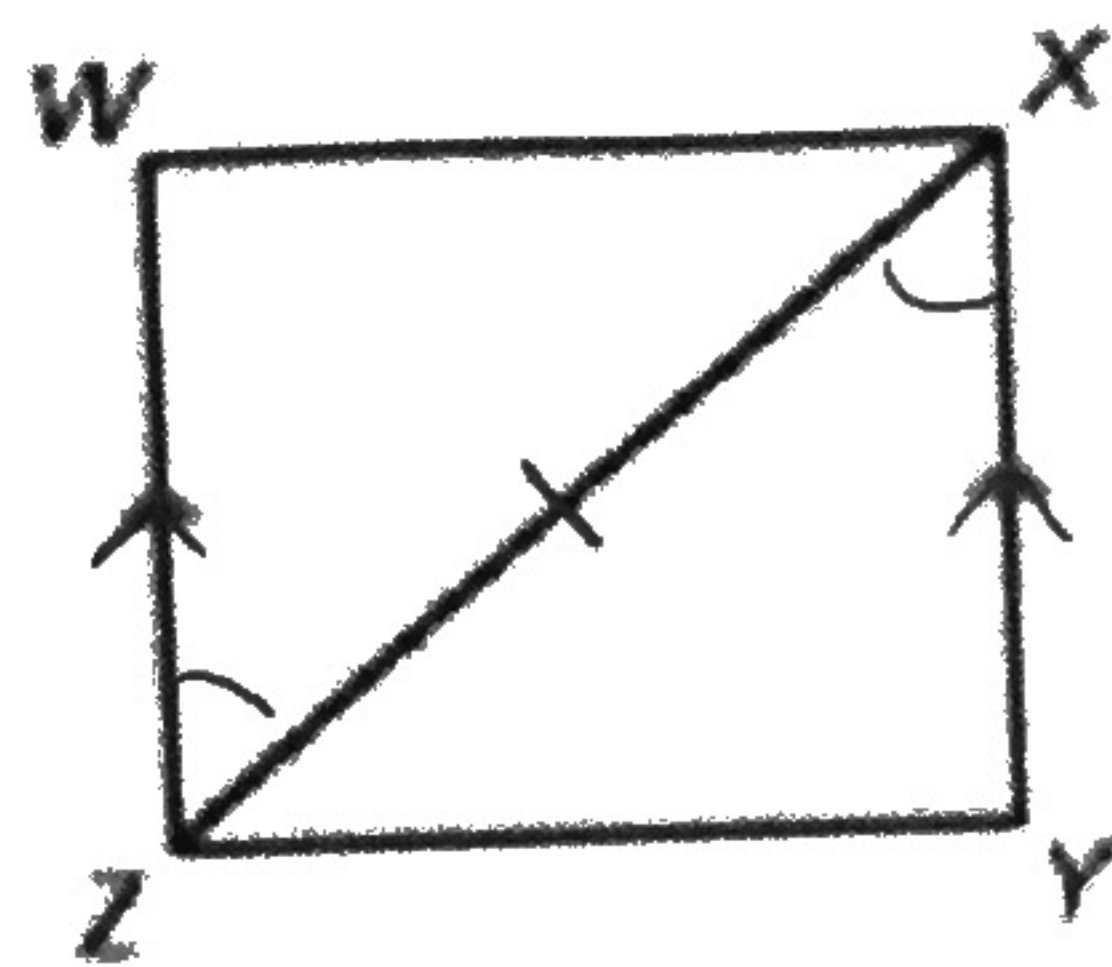


Given

Given

ASA

26. $\triangle WXZ, \triangle YZX$



Not enough information. (need one more angle)



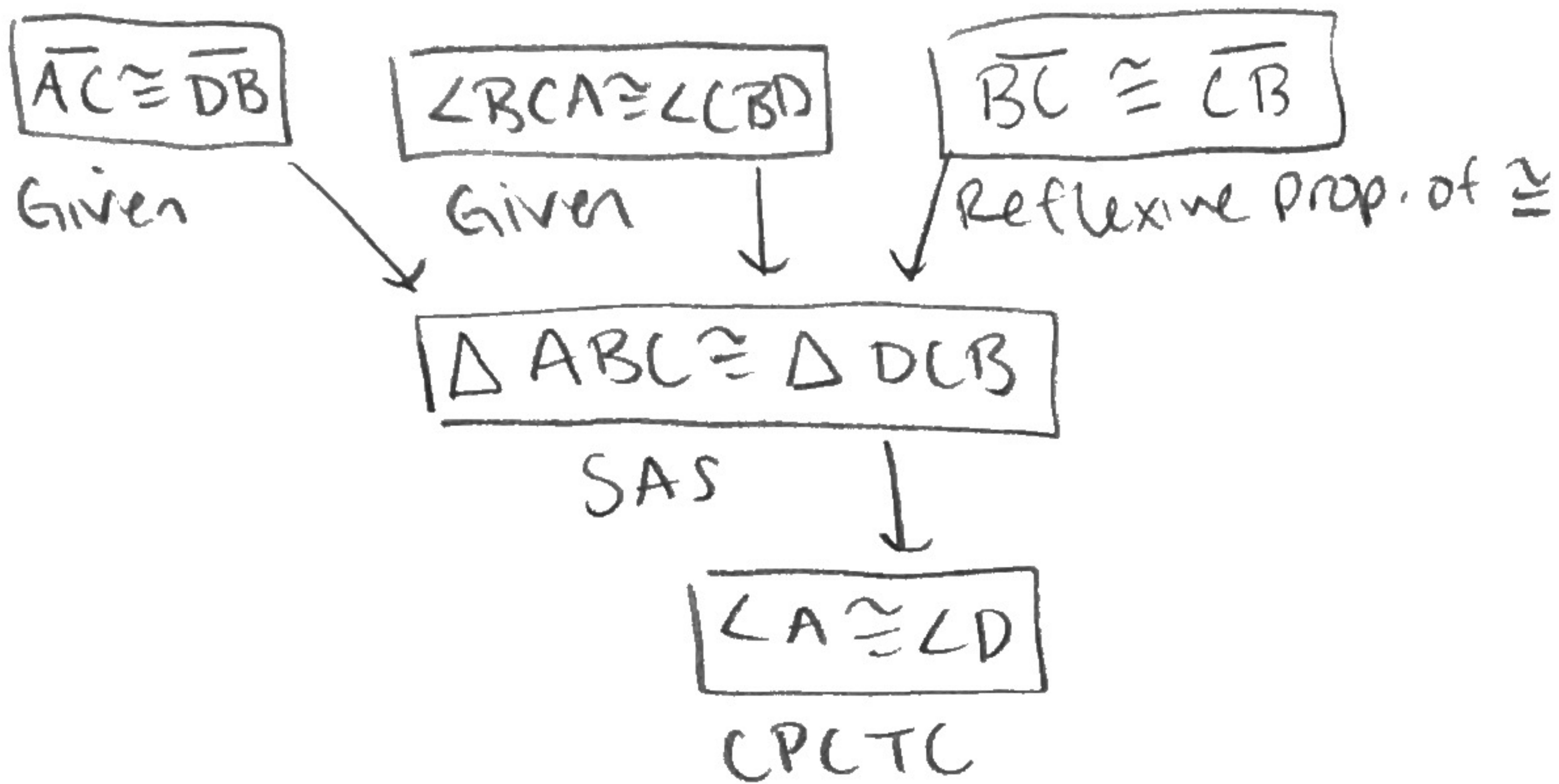
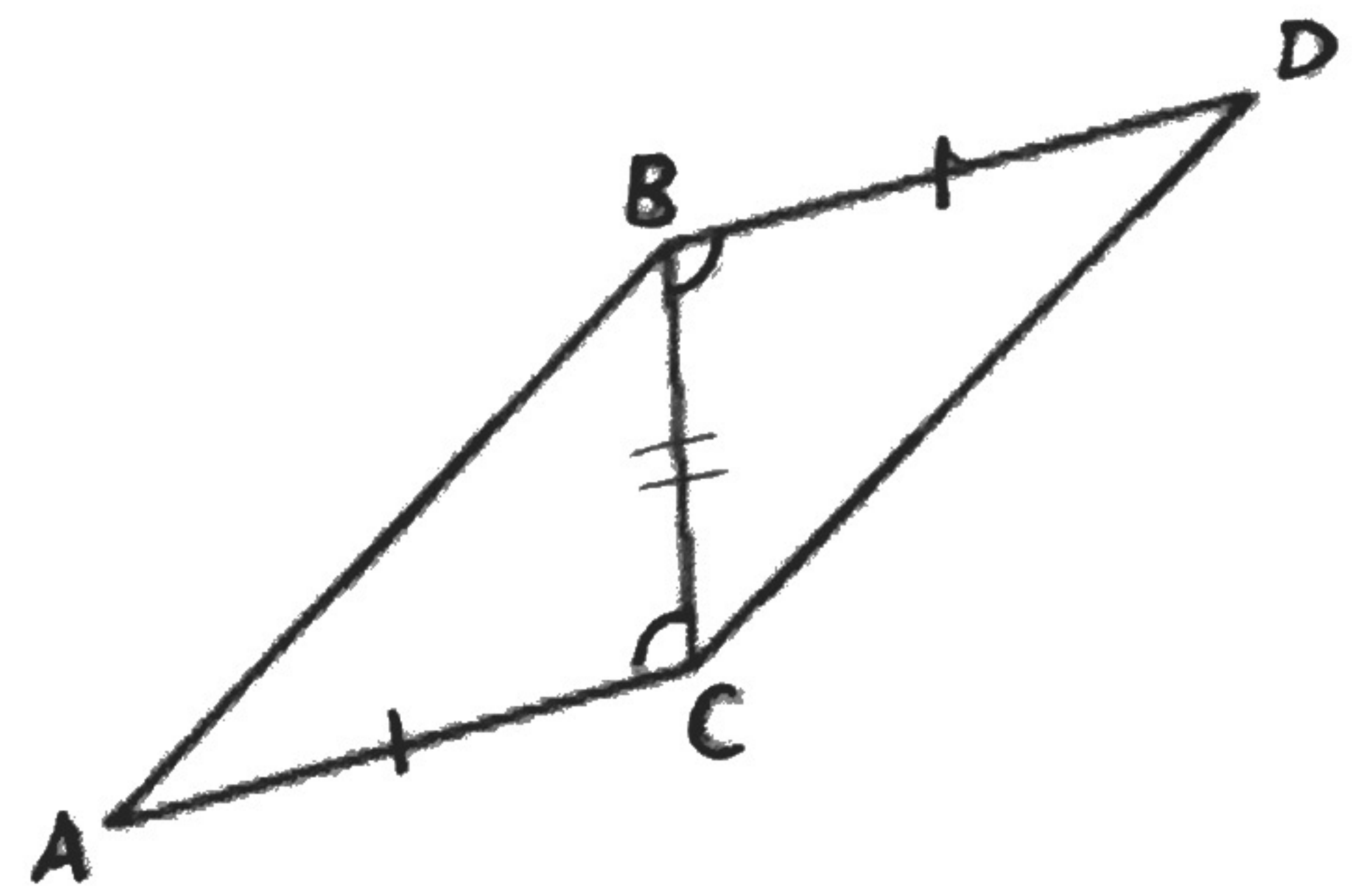
Reflexive Prop. of \cong

4.7 Using Congruent Triangles

27. Write a proof.

Given: $\overline{AC} \cong \overline{DB}$, $\angle BCA \cong \angle CBD$

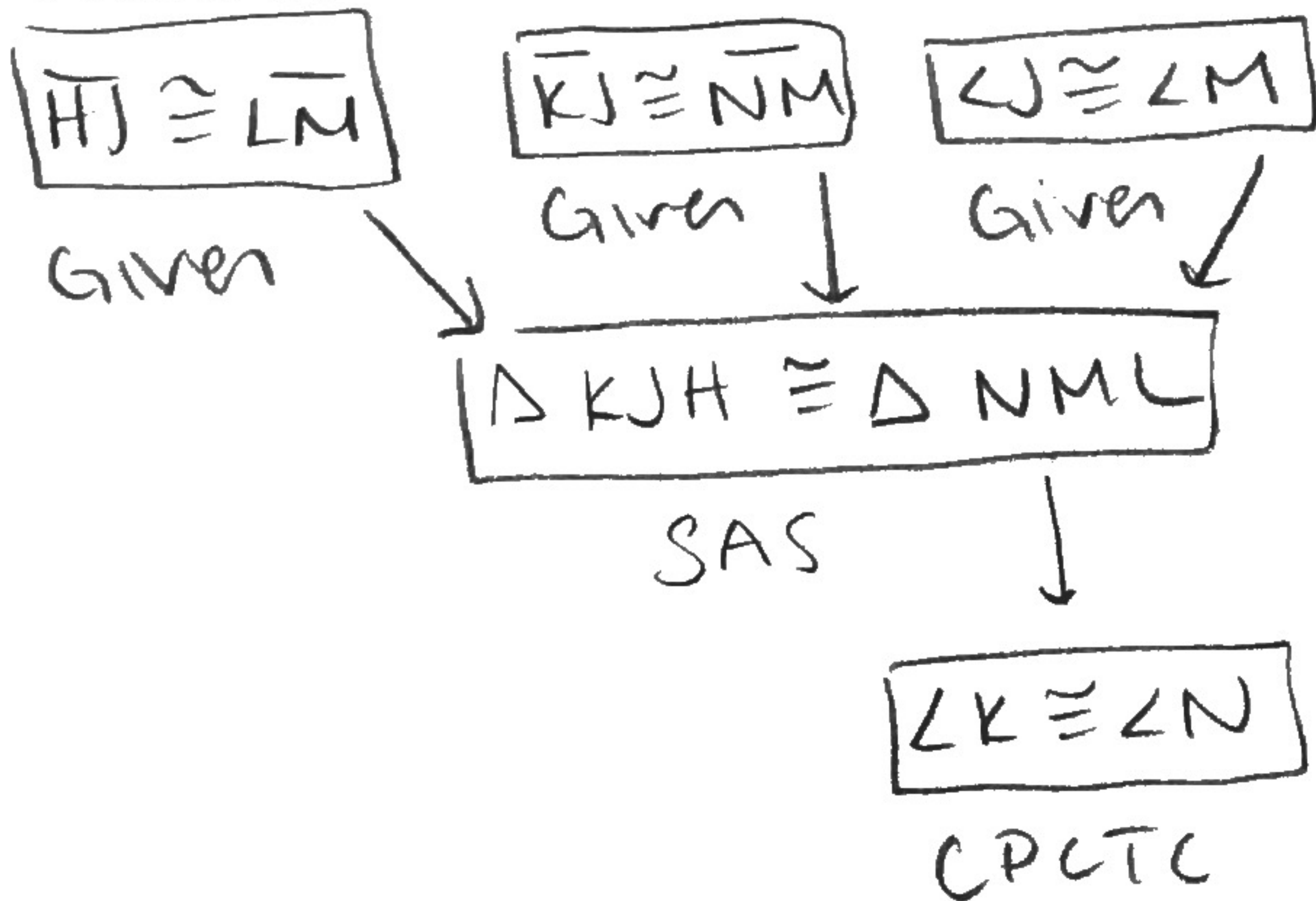
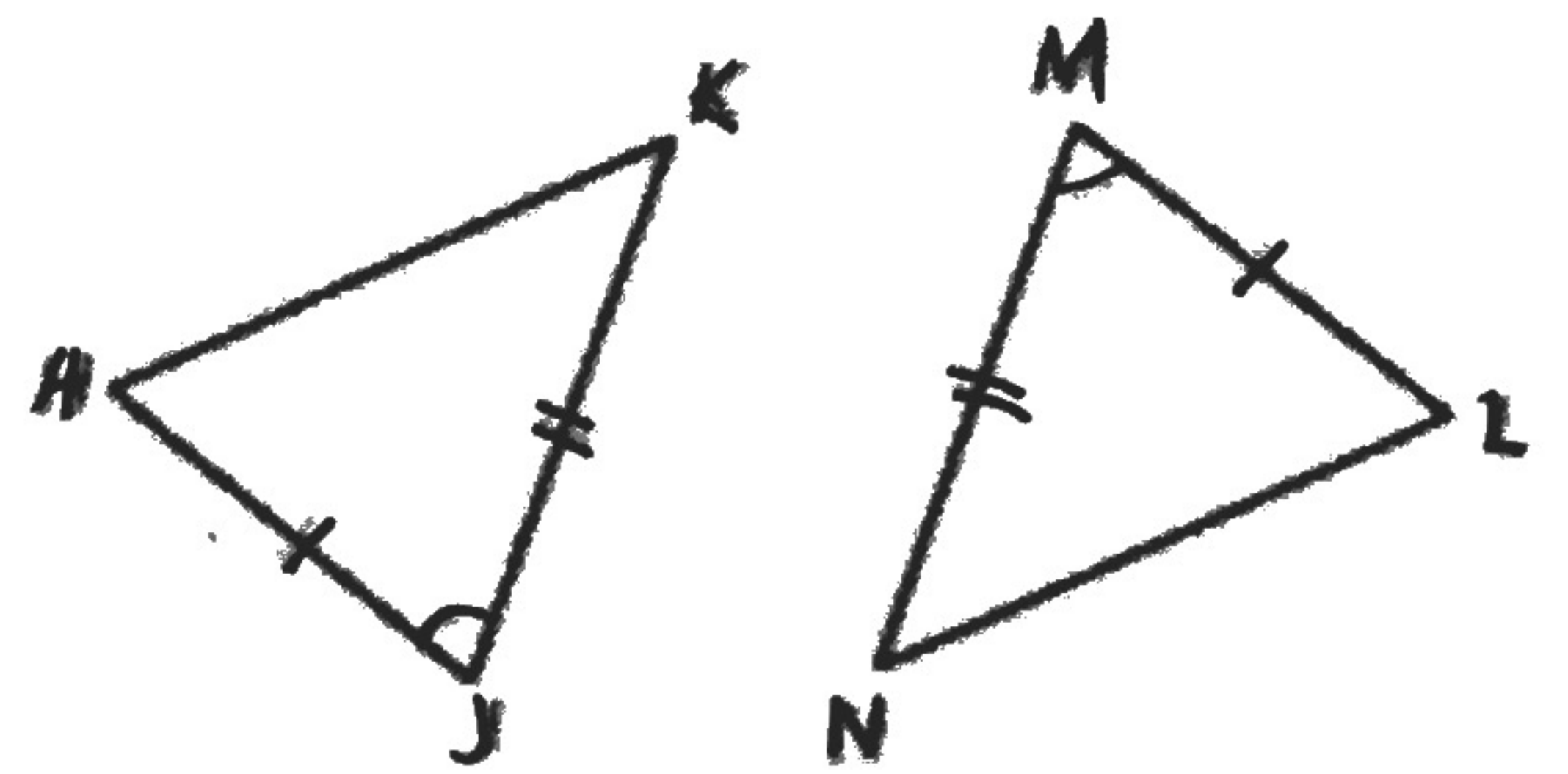
Prove: $\angle A \cong \angle D$



28. Write a proof.

Given: $\overline{HJ} \cong \overline{LM}$, $\overline{KJ} \cong \overline{NM}$, $\angle J \cong \angle M$

Prove: $\angle K \cong \angle N$



29. Write a proof.

Given: $\overline{SV} \cong \overline{TV}$, $\overline{SQ} \cong \overline{TQ}$

Prove: $\angle 1 \cong \angle 2$

