

# PROMPTING STATEMENTS ON TRIANGLE CONGRUENCE



*At the end of the lesson the students will be able to....*

- ✓ Recall the different triangle congruence postulates and theorems
- ✓ Identify statements on triangle congruence
- ✓ Apply the postulates and theorems on triangle congruence to prove statements

The background is white with several decorative elements: a purple triangle in the top-left corner, a yellow triangle in the top-right corner, and a pink triangle in the bottom-left corner. There are also several small, light gray circles scattered around. A large, faint, light gray circle is centered behind the text.

# **Activity:**

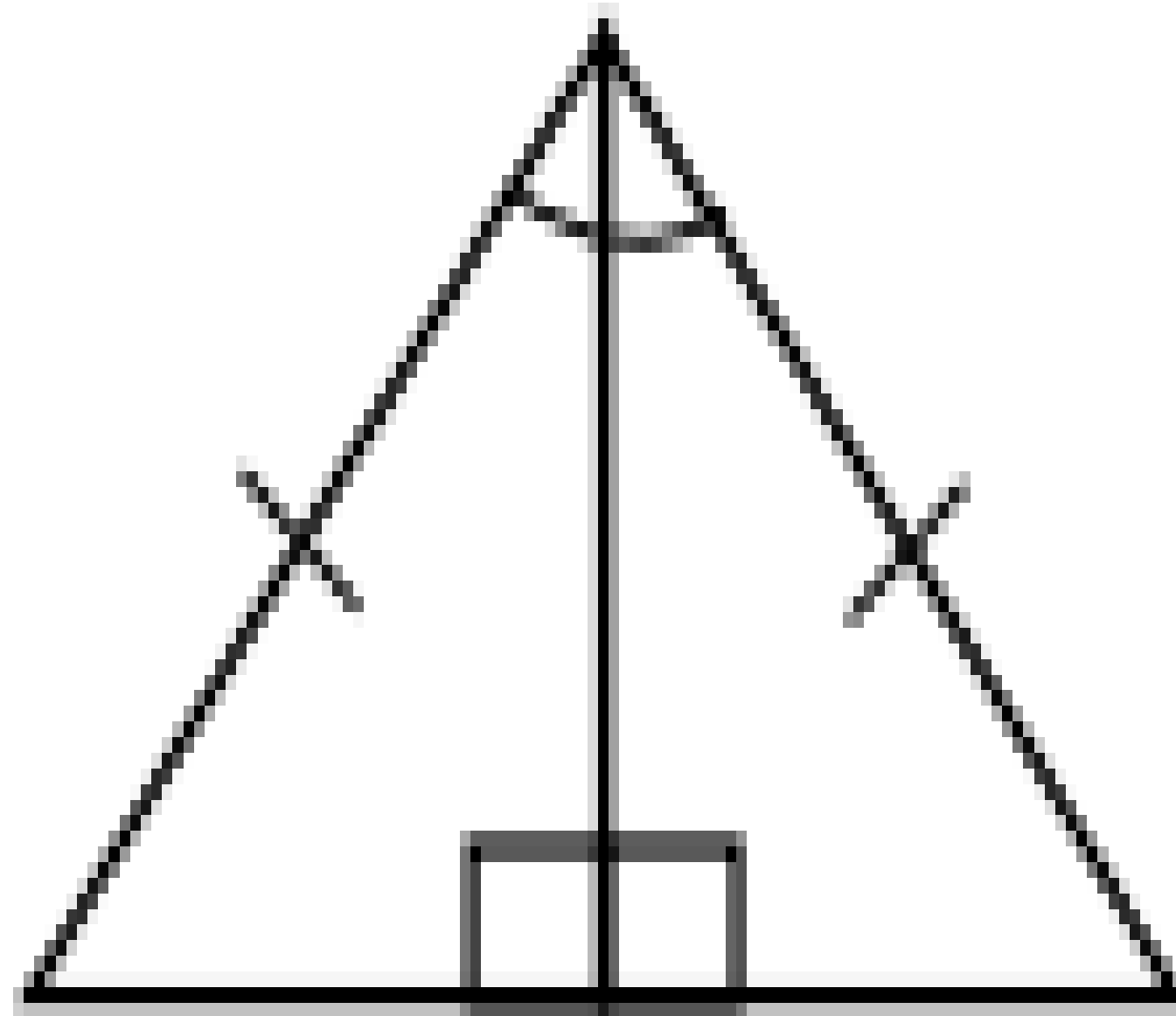
# **FIND MY MATCH!**

**SSS CONGRUENCE**

**SAS CONGRUENCE**

**ASA CONGRUENCE**

**AAS CONGRUENCE**



**HyA CONGRUENCE**

**HyL CONGRUENCE**

**LA CONGRUENCE**

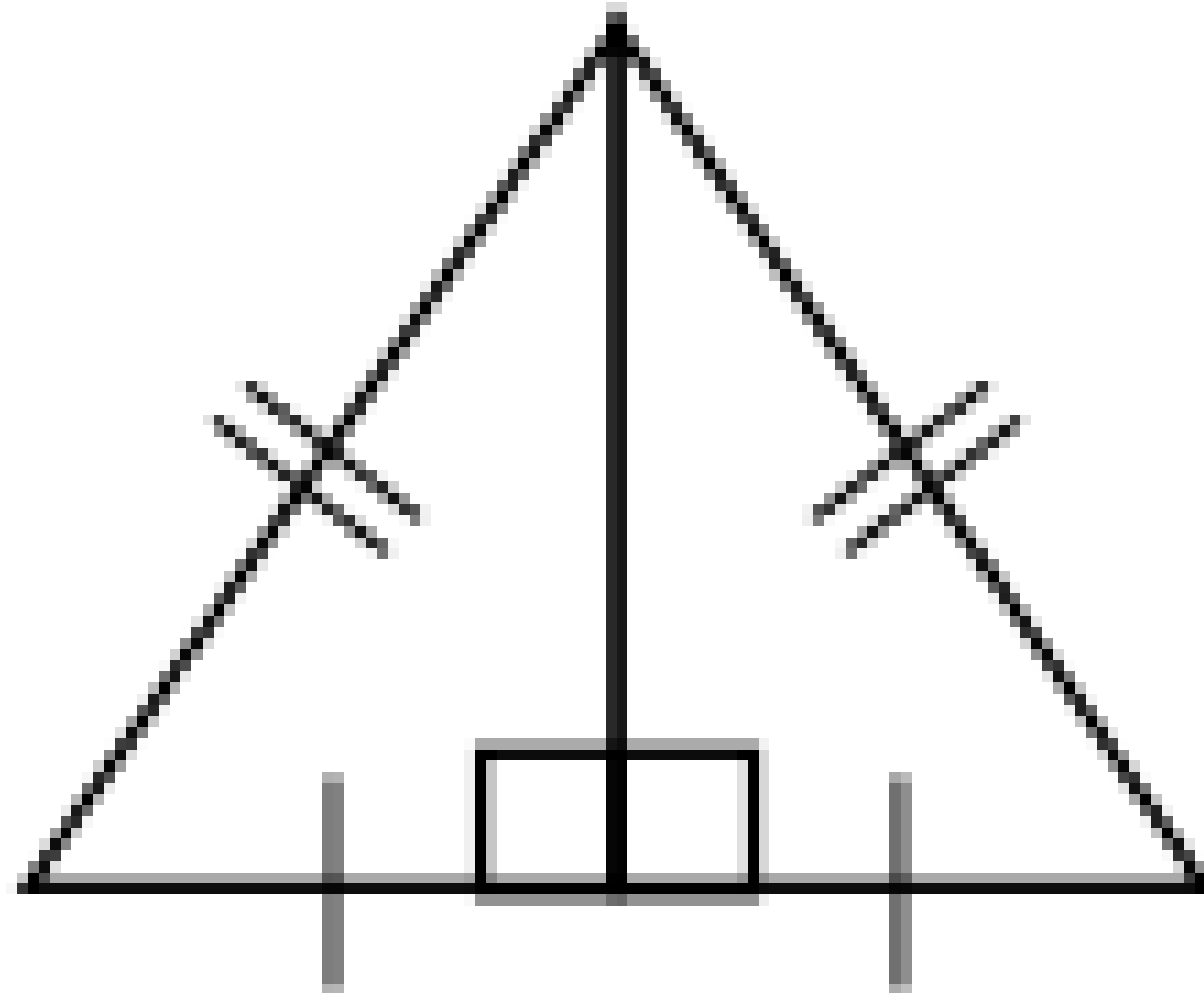
**LL CONGRUENCE**

**SSS CONGRUENCE**

**SAS CONGRUENCE**

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**AAS CONGRUENCE**



**HyA CONGRUENCE**

**HyL CONGRUENCE**

**LA CONGRUENCE**

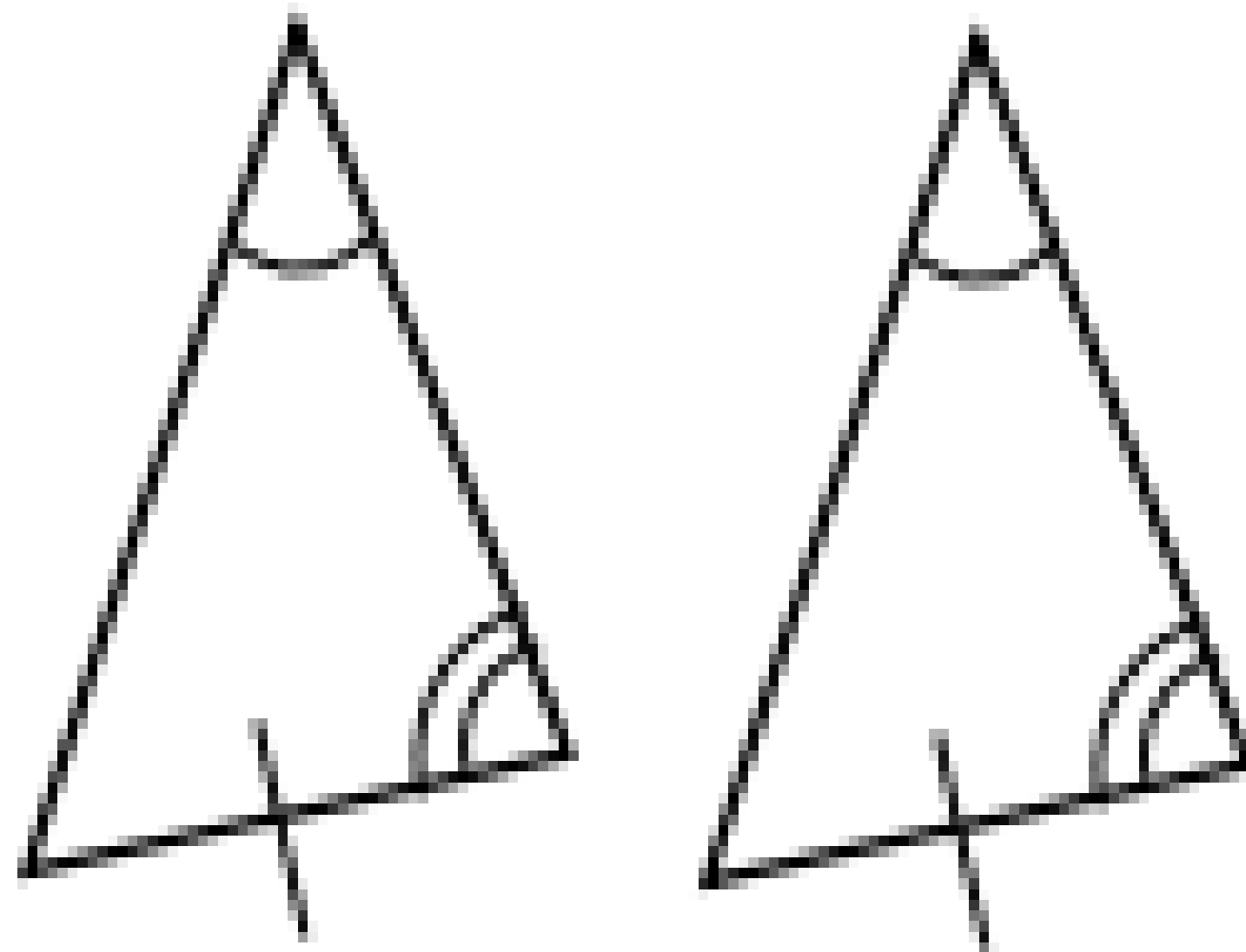
**LL CONGRUENCE**

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**HyA CONGRUENCE**

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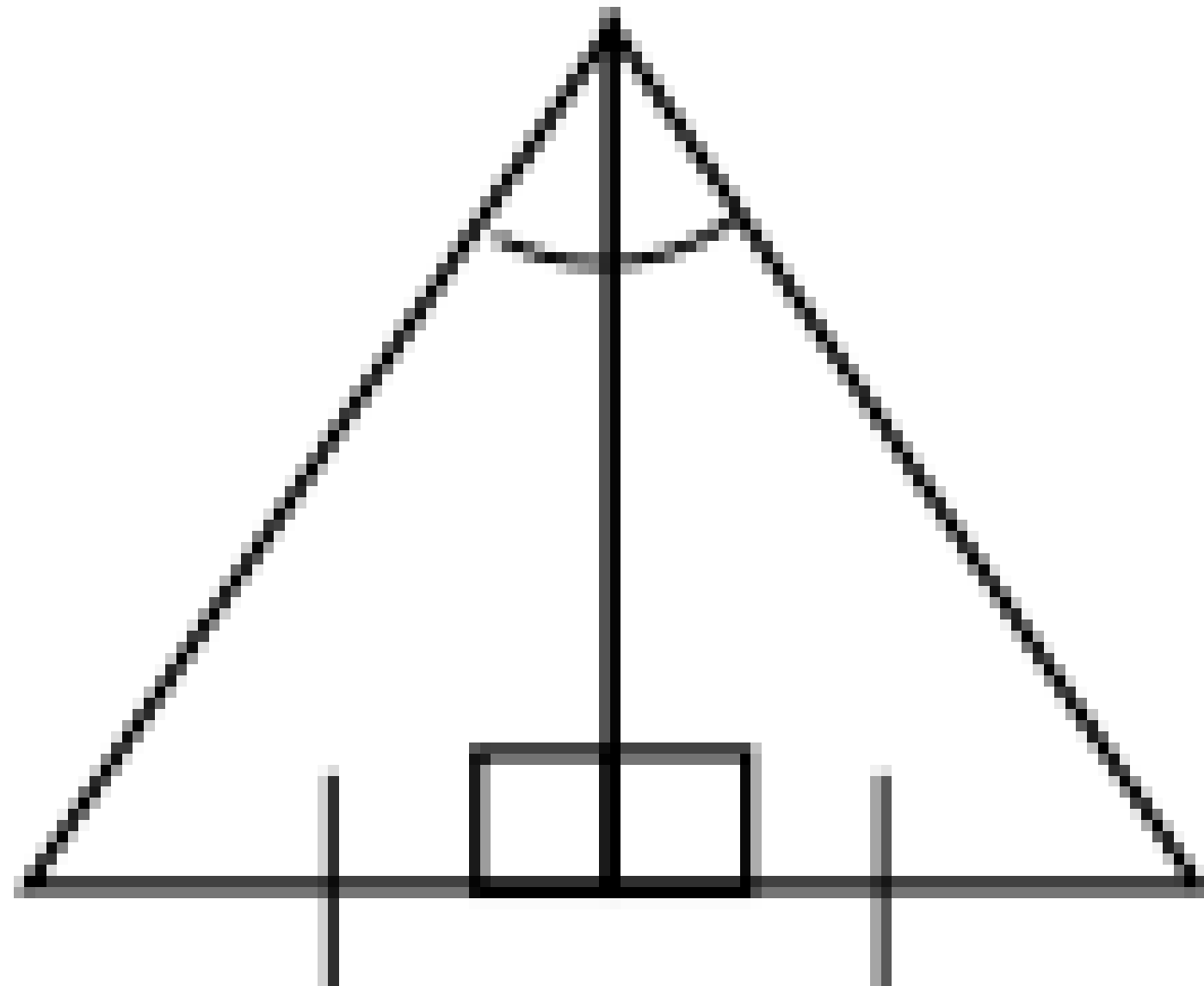
**LL CONGRUENCE**

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**HyA CONGRUENCE**

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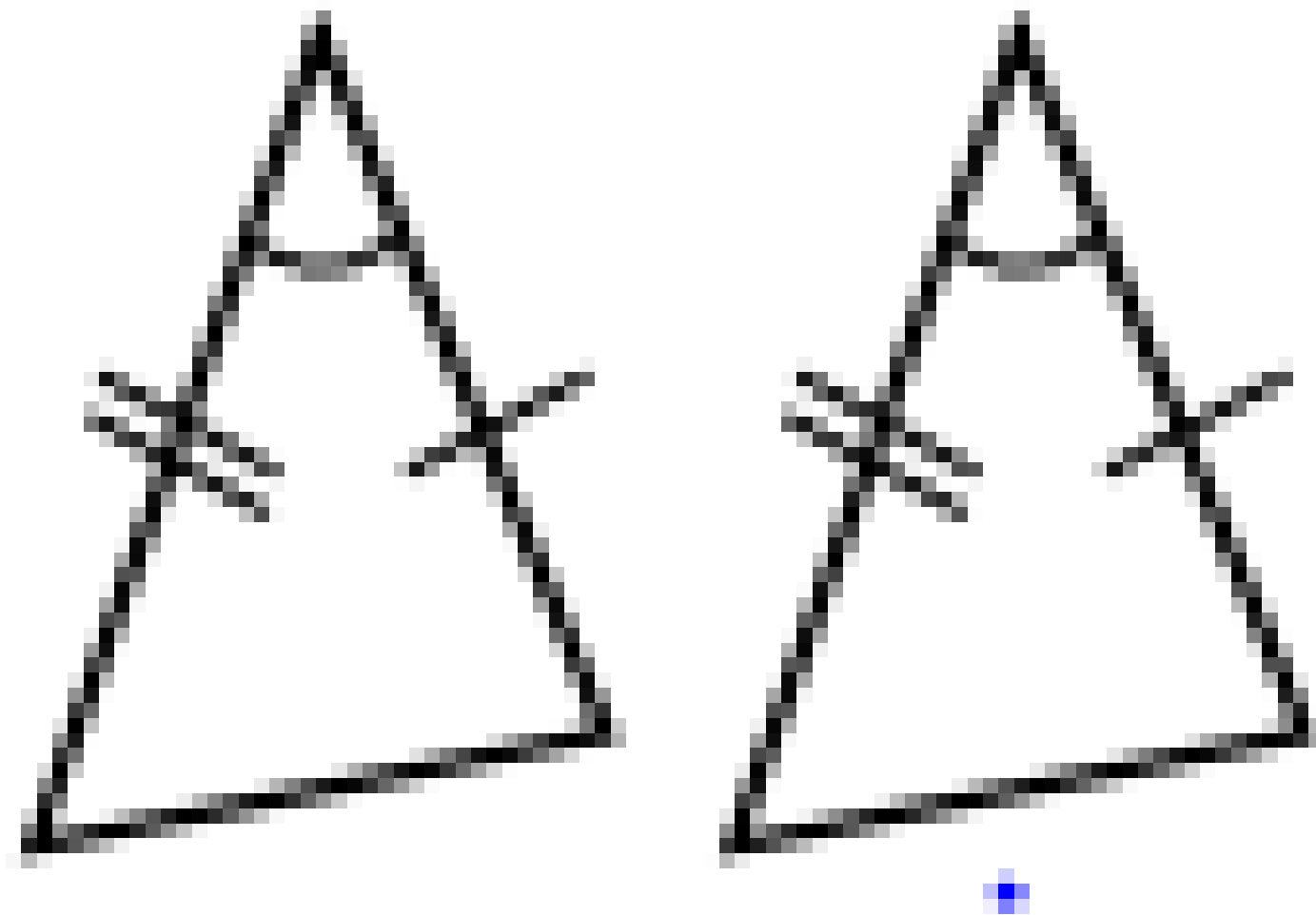


**SSS CONGRUENCE**

**SAS CONGRUENCE**

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**HyA CONGRUENCE**

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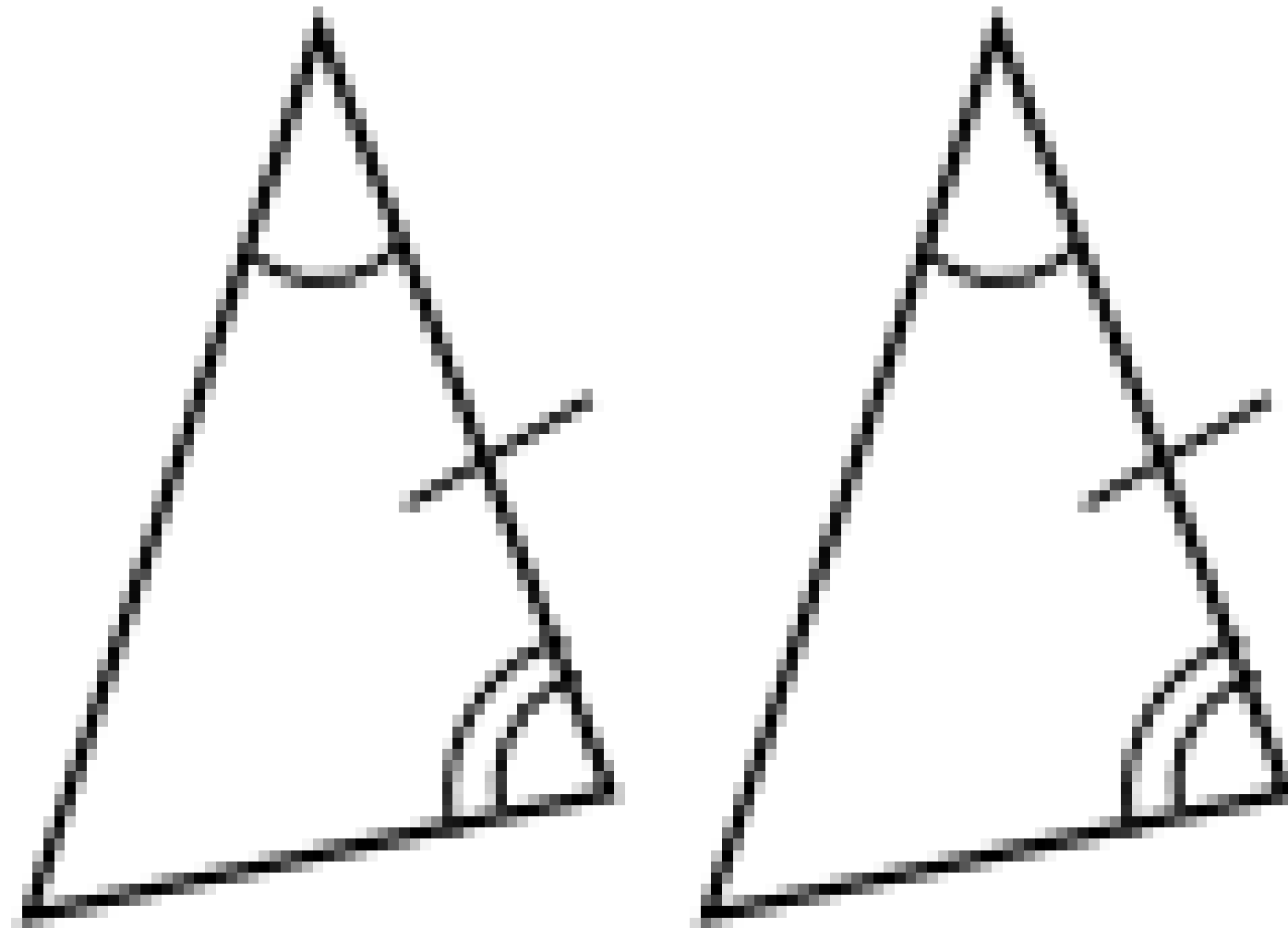


**SSS CONGRUENCE**

**SAS CONGRUENCE**

**ASA CONGRUENCE**

**AAS CONGRUENCE**



**HyA CONGRUENCE**

**HyL CONGRUENCE**

**LA CONGRUENCE**

**LL CONGRUENCE**

**SSS CONGRUENCE**

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**HyA CONGRUENCE**

**HyL CONGRUENCE**

**LA CONGRUENCE**

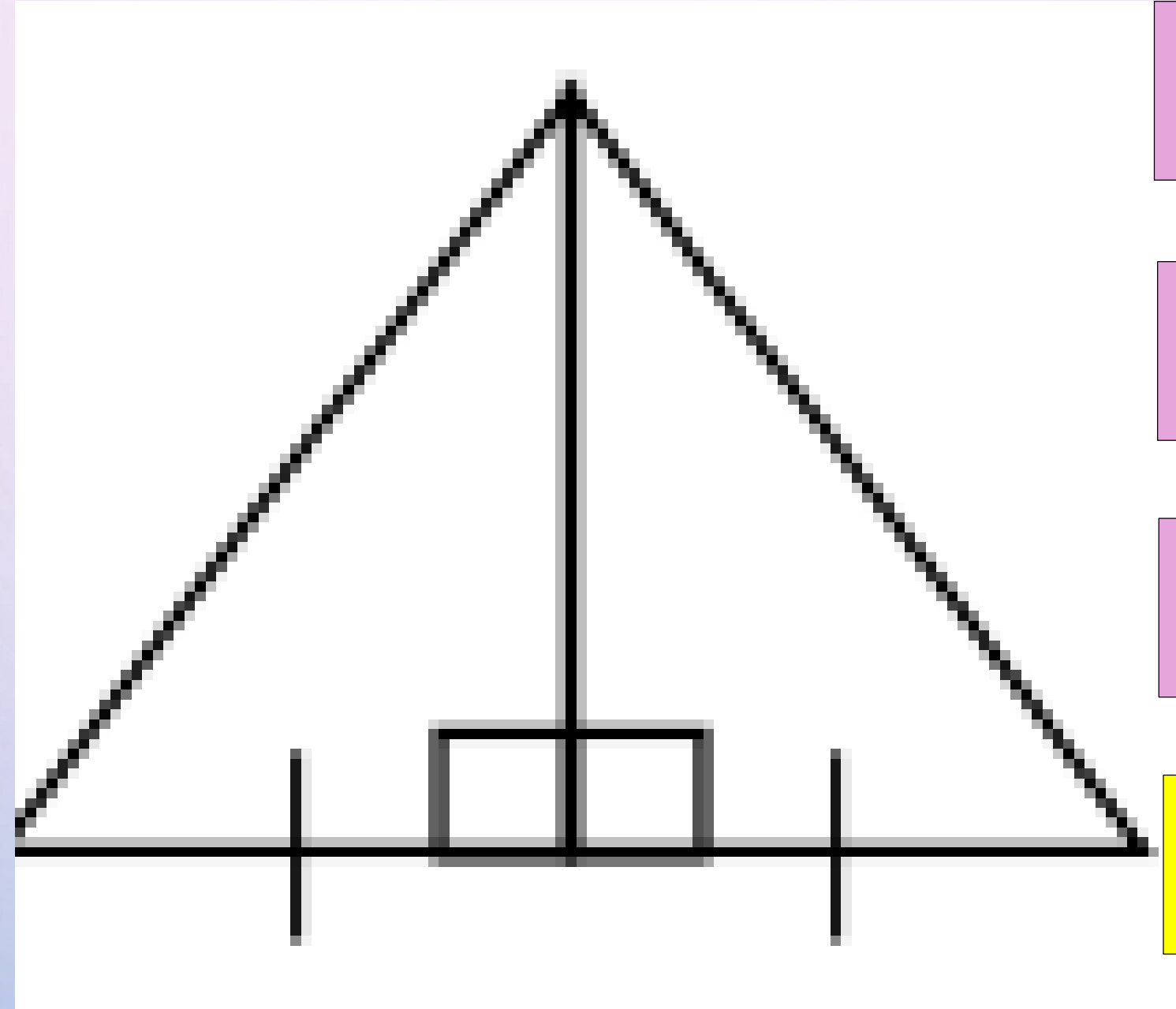
**LL CONGRUENCE**

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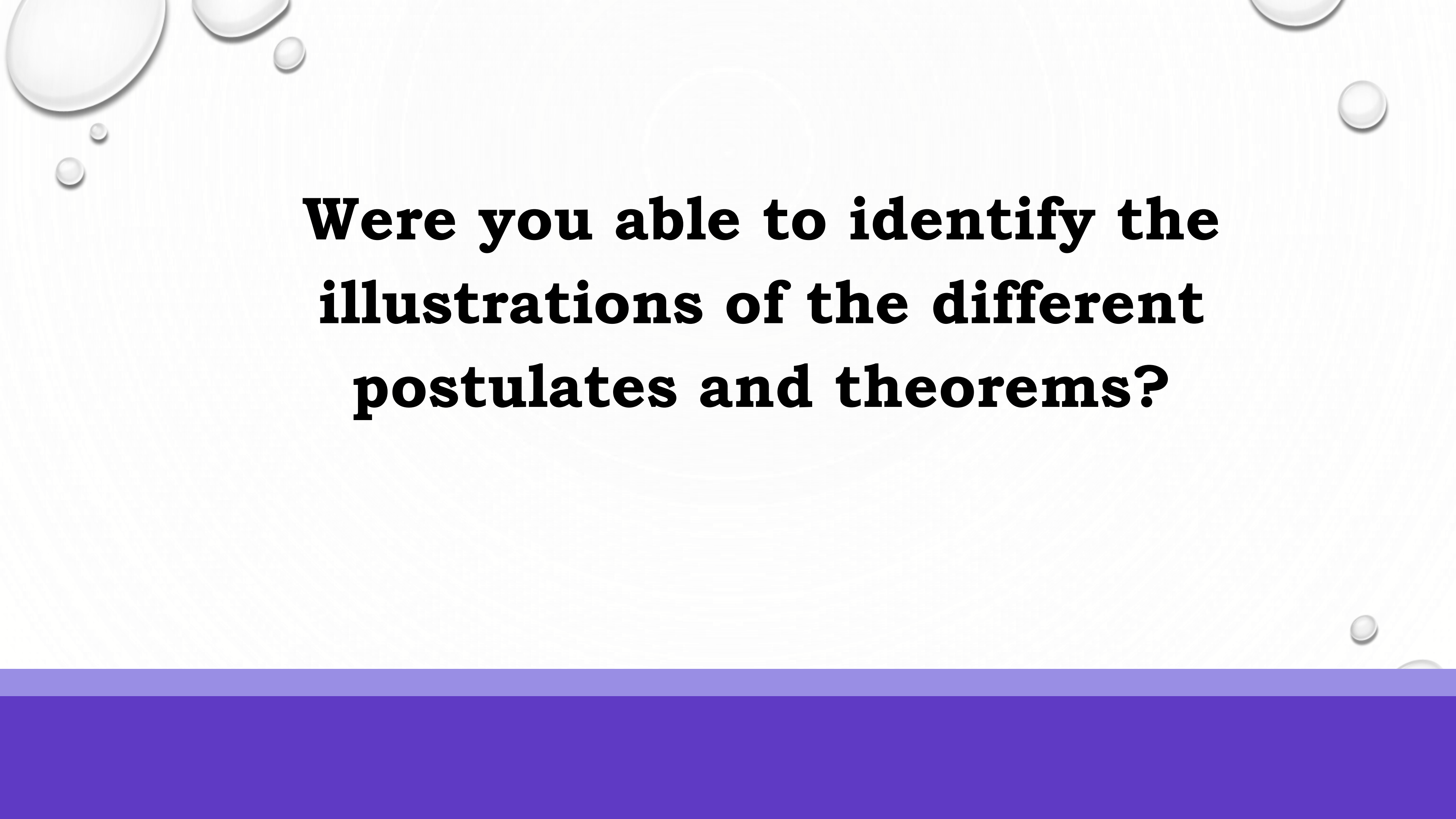


**HyA CONGRUENCE**

**HyL CONGRUENCE**

**LA CONGRUENCE**

**LL CONGRUENCE**



**Were you able to identify the  
illustrations of the different  
postulates and theorems?**

**How did you identify the  
illustration of the given  
theorem or postulate?**

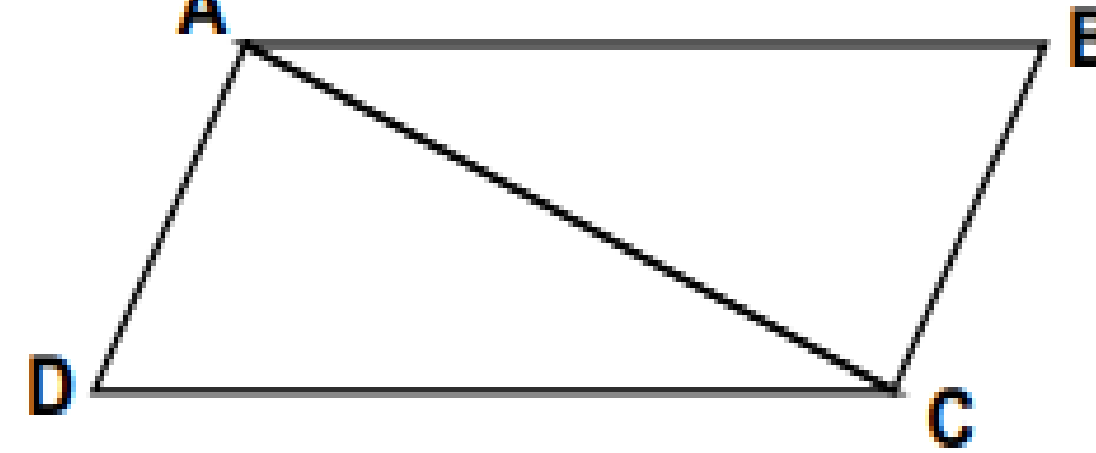
# PROMPTING STATEMENTS ON TRIANGLE CONGRUENCE



1. Given:  $\angle D \cong \angle B$   
 $\angle DAC \cong \angle BCA$

Prove:  $\angle ACD \cong \angle CAB$

Proof:



Statements	Reasons
1. _____ (What are the given statements?)	1. Given
2. $\overline{AC} \cong \overline{AC}$	2. Reflexive Property
3. $\triangle ADC \cong \triangle CBA$	3. _____ (Based on the statements, what theorem can justify $\triangle ADC \cong \triangle CBA$ ?)
4. $\angle ACD \cong \angle CAB$	4. _____ (What can justify the congruence of the corresponding parts of congruent triangles?)

Example No. 1



## Solution: (Complete Proof)

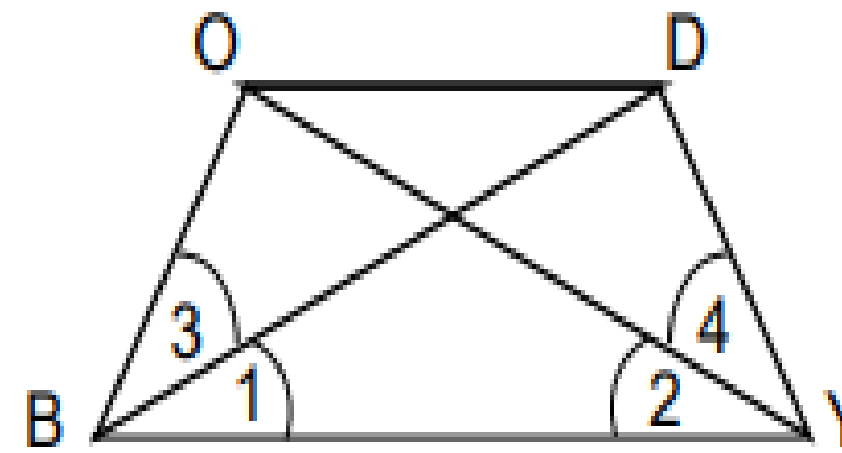
Statements	Reasons
1. $\angle D \cong \angle B$ $\angle DAC \cong \angle BCA$	1. Given
2. $\overline{AC} \cong \overline{AC}$	2. Reflexive Property
3. $\triangle ADC \cong \triangle CBA$	3. AAS Congruence Theorem
4. $\angle ACD \cong \angle CAB$	4. CPCTC

Example No. 1

Given:  $\overline{DB} \cong \overline{OY}$

$\angle 1 \cong \angle 2$

Prove:  $\overline{OB} \cong \overline{DY}$



Proof:

Statements	Reasons
1. _____ (What are the given statements?)	1. Given
2. _____ (Which side of $\triangle BOY$ and $\triangle YDB$ is common?)	2. Reflexive Property
3. _____ (What are the congruent triangles based on the previous statements?)	3. SAS Congruence Postulate
4. _____ (What is to be proven?)	4. CPCTC

Example No. 2

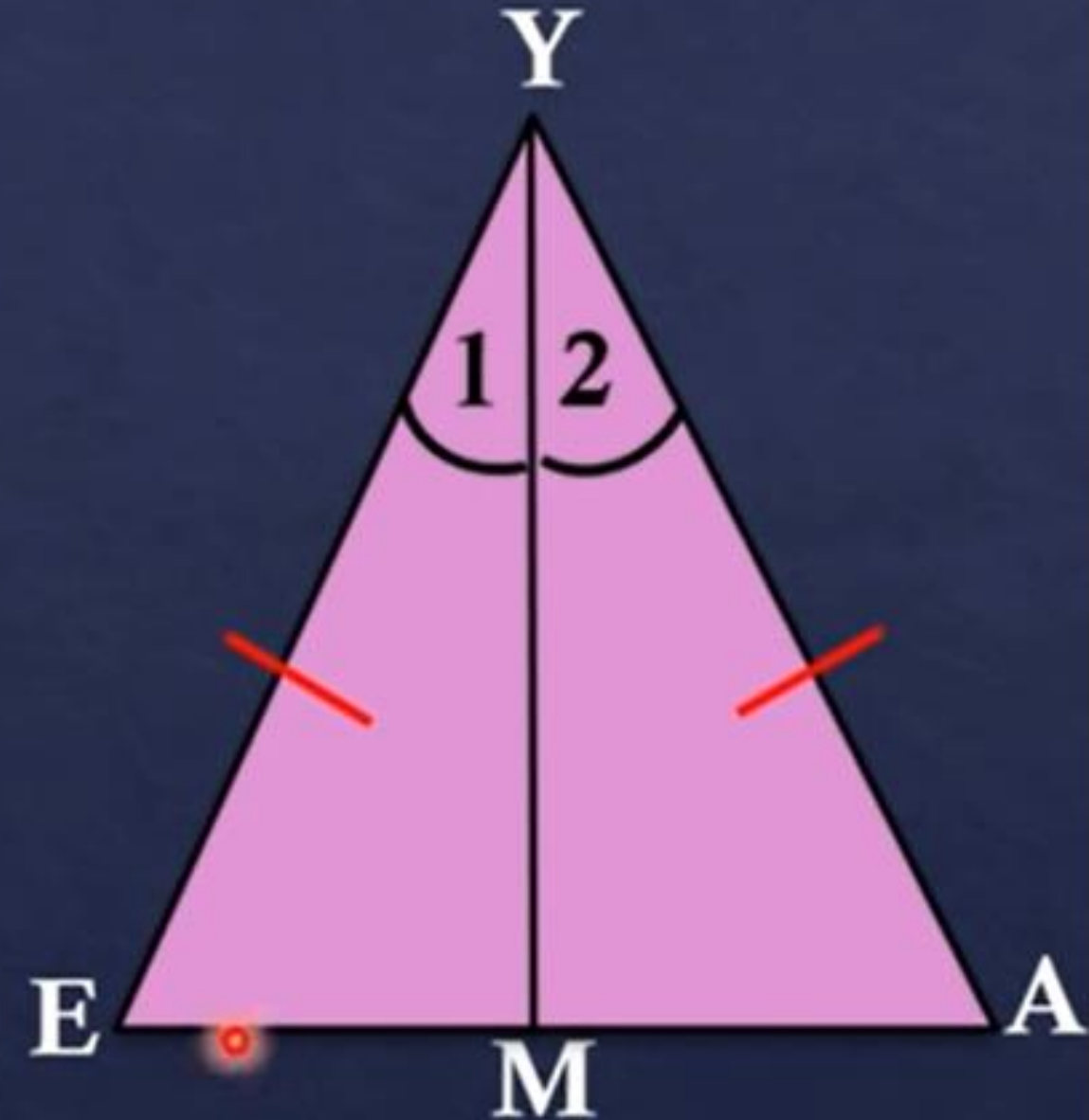
## Solution: (Complete Proof)

Statements	Reasons
1. $\overline{DB} \cong \overline{OY}$ $\angle 1 \cong \angle 2$	1. Given
2. $\overline{BY} \cong \overline{BY}$	2. Reflexive Property
3. $\triangle BOY \cong \triangle YDB$	3. SAS Congruence Postulate
4. $\overline{OB} \cong \overline{DY}$	4. CPCTC

Example No. 2

**Given:**  $\overline{EY} \cong \overline{AY}$ ;  $\angle 1 \cong \angle 2$

**Prove:**  $M$  is the midpoint of  $\overline{EA}$



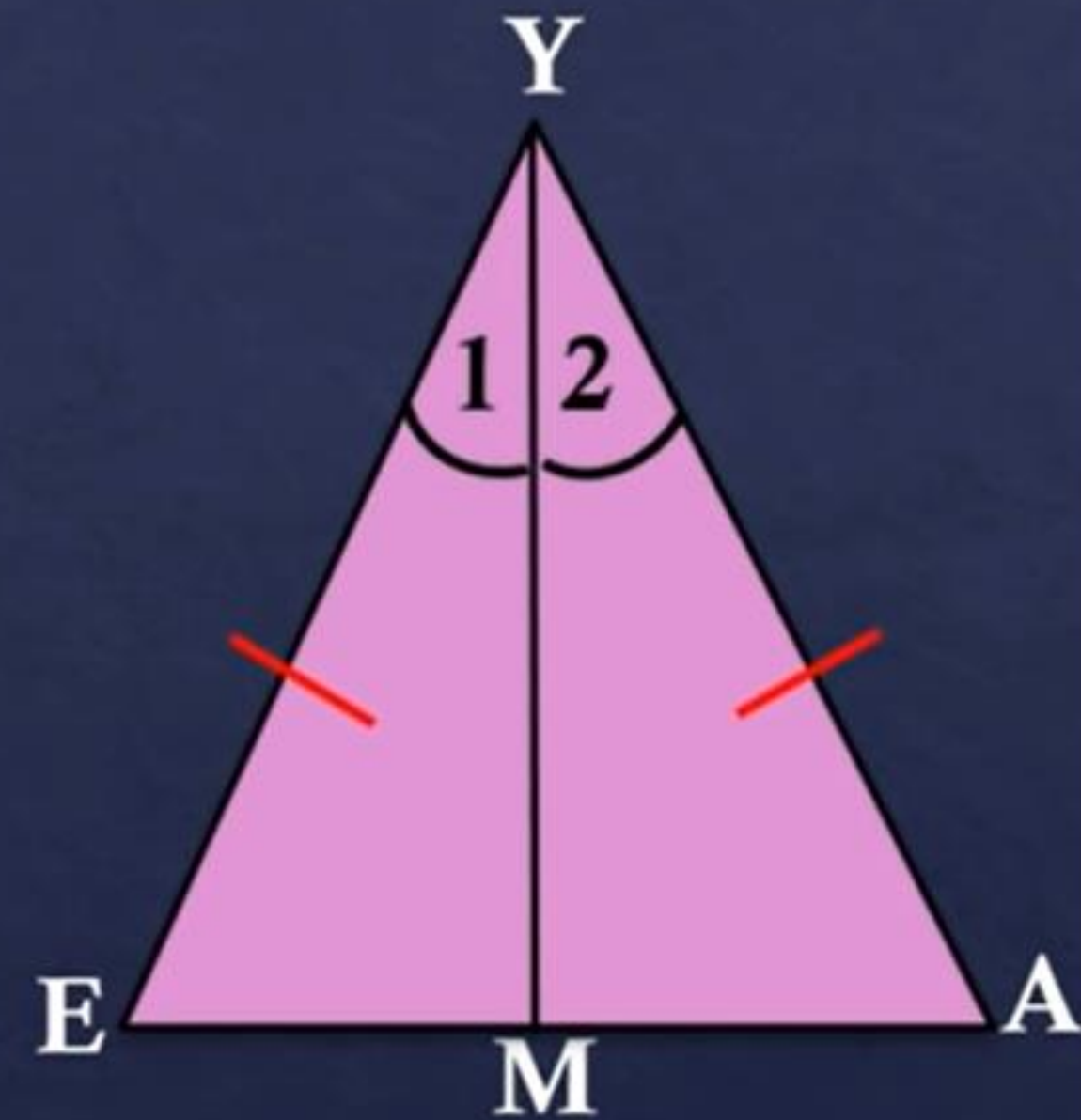
Example No. 3

**Given:**  $\overline{EY} \cong \overline{AY}$ ;  $\angle 1 \cong \angle 2$

**Prove:**  $M$  is the midpoint of  $\overline{EA}$

**Proof:**

Statements	Reasons
1. $\overline{EY} \cong \overline{AY}$ ; $\angle 1 \cong \angle 2$	1. Given
2.	2.
3.	3.
4.	4.
5.	5.



Example No. 3

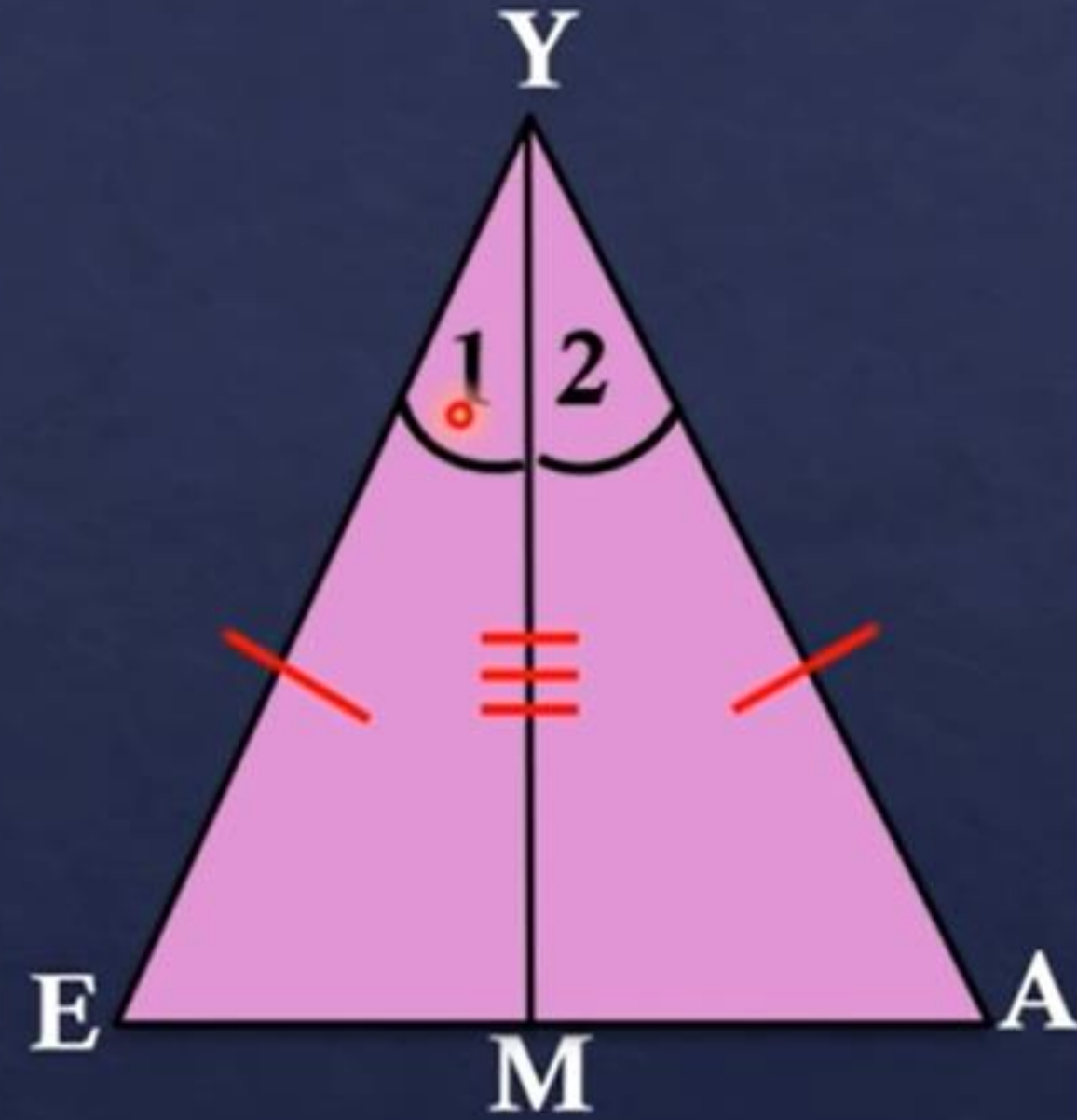


**Given:**  $\overline{EY} \cong \overline{AY}$ ;  $\angle 1 \cong \angle 2$

**Prove:**  $M$  is the midpoint of  $\overline{EA}$

**Proof:**

Statements	Reasons
1. $\overline{EY} \cong \overline{AY}$ ; $\angle 1 \cong \angle 2$	1. Given
2. $\overline{MY} \cong \overline{MY}$	2. Reflexive Property of Congruence
3. $\triangle YEM \cong \triangle YAM$	3. SAS Congruence Post.
4.	4.
5.	5.



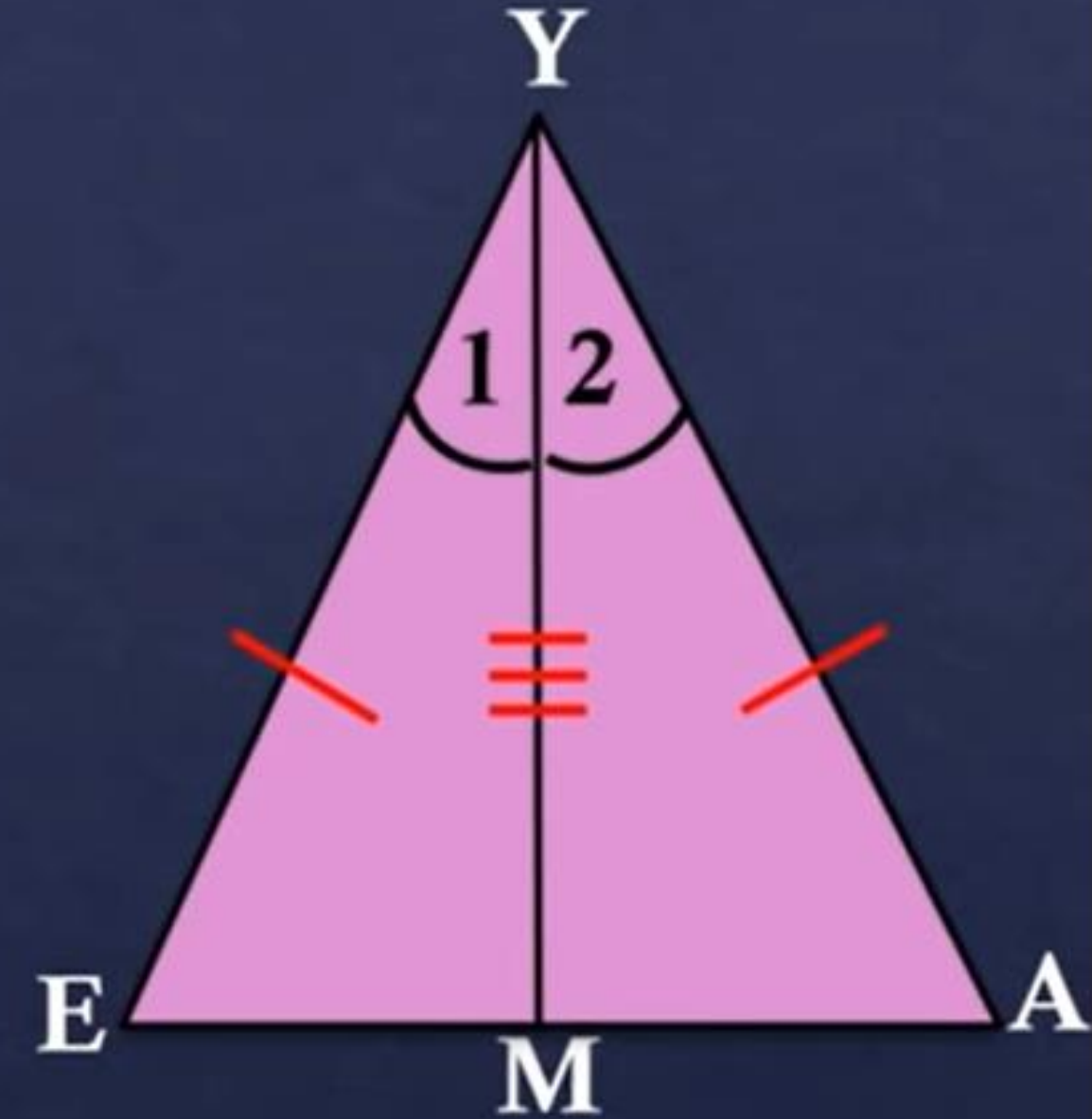
Example No. 3

**Given:**  $\overline{EY} \cong \overline{AY}$ ;  $\angle 1 \cong \angle 2$

**Prove:**  $M$  is the midpoint of  $\overline{EA}$

**Proof:**

Statements	Reasons
1. $\overline{EY} \cong \overline{AY}$ ; $\angle 1 \cong \angle 2$	1. Given
2. $\overline{MY} \cong \overline{MY}$	2. Reflexive Property of Congruence
3. $\triangle YEM \cong \triangle YAM$	3. SAS Congruence Post.
4. $\overline{EM} \cong \overline{AM}$	4. CPCTC
5. $M$ is the midpoint of $\overline{EA}$	5. Midpoint Theorem



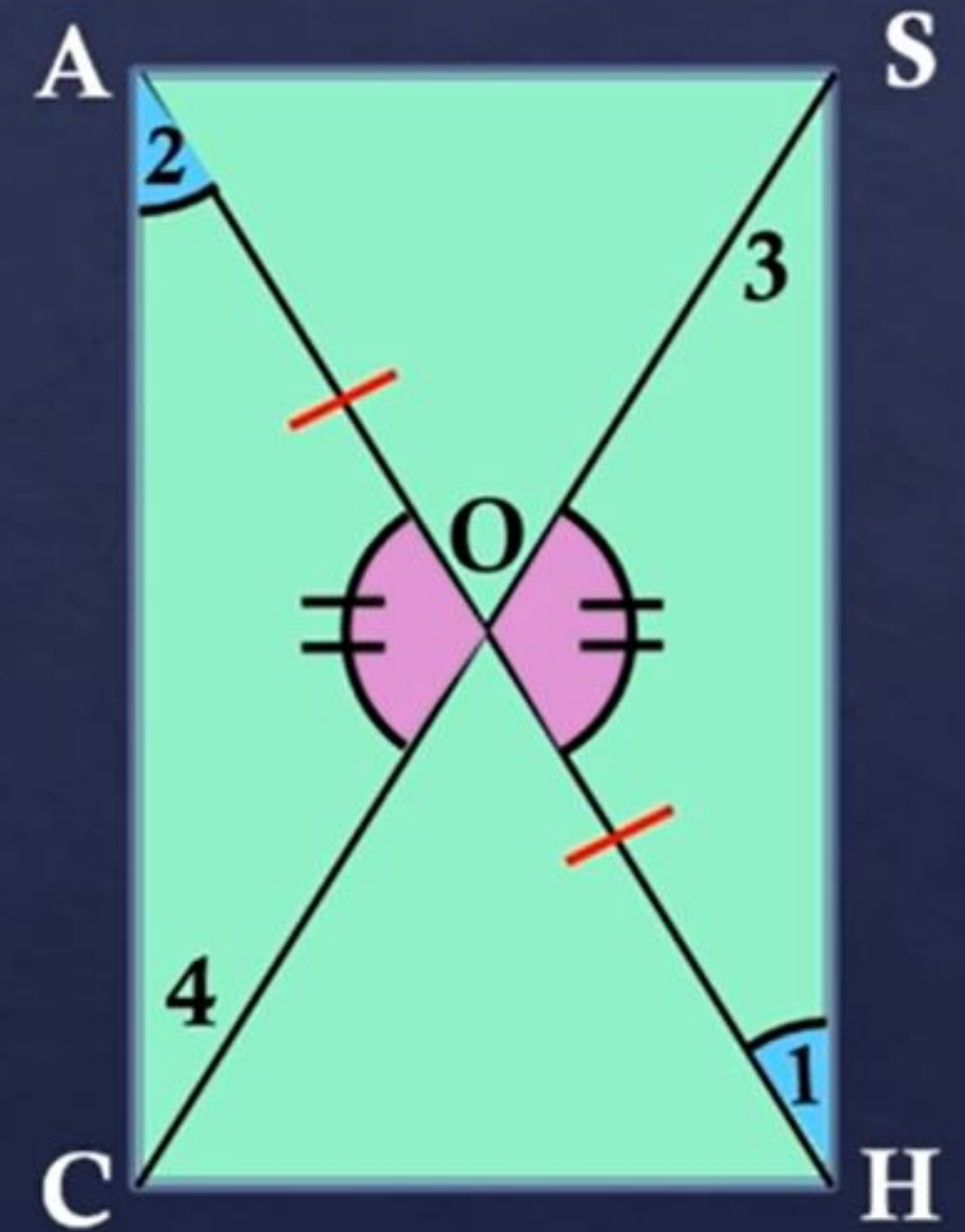
Example No. 3



**Prove:**  $\angle 3 \cong \angle 4$

### Proof:

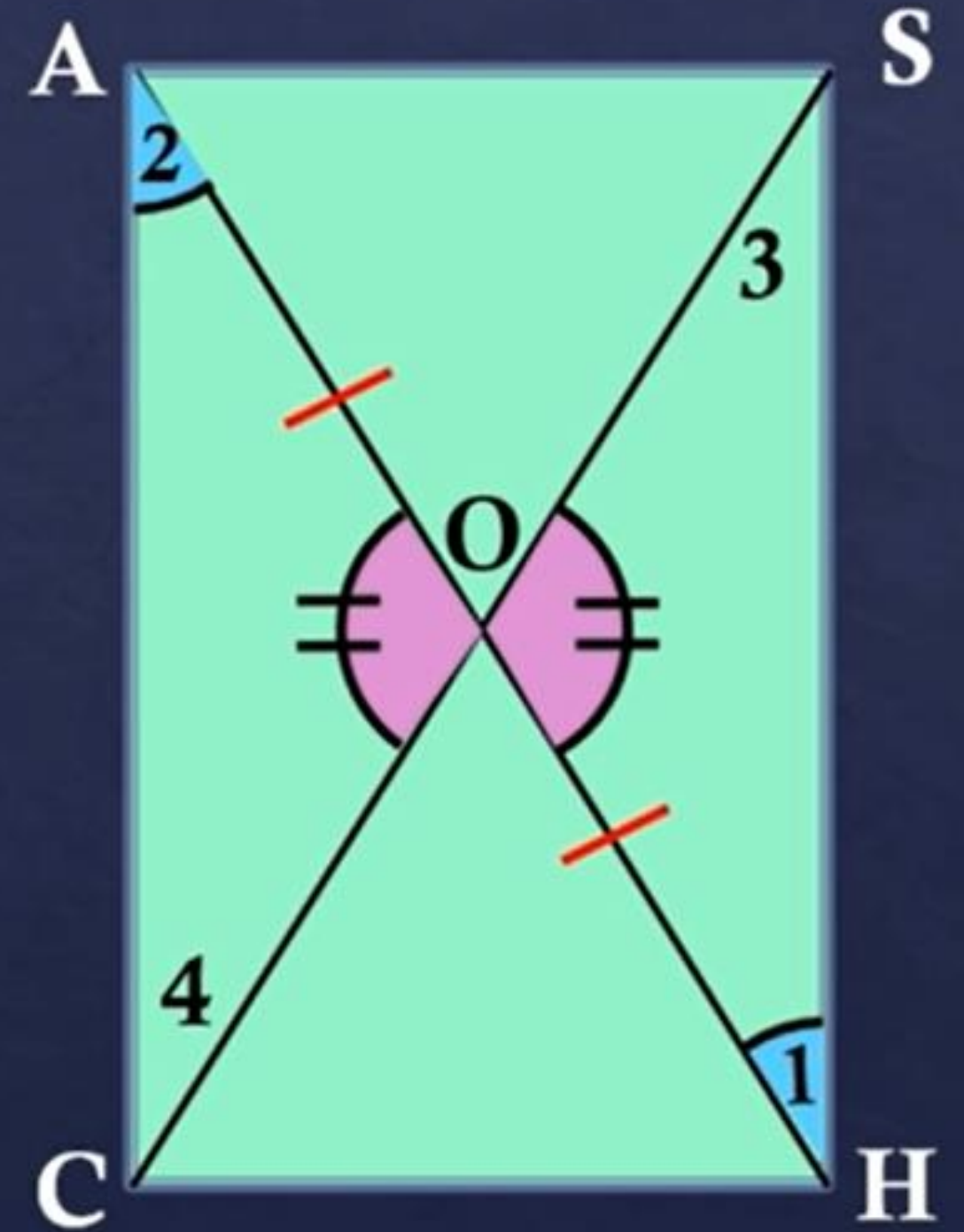
Statements	Reasons
1. $O$ is the midpoint of $\overline{HA}$	1. Given



## Example No. 4

**Prove:**  $\angle 3 \cong \angle 4$

Statements	Reasons
1. O is the midpoint of $\overline{HA}$	1. Given
2. $\overline{HO} \cong \overline{AO}$	2. Midpoint Theorem



## Example No. 4

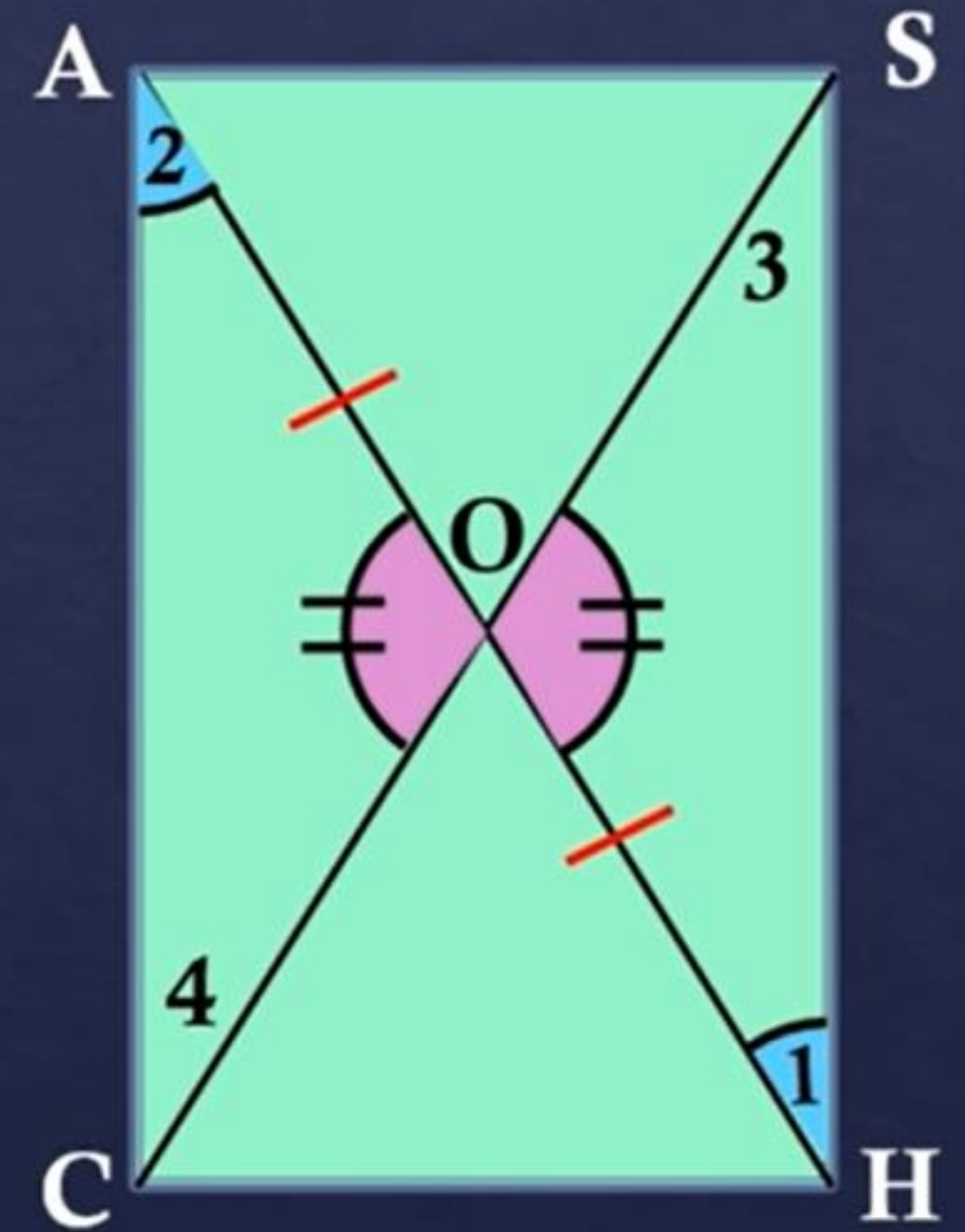


**Given:**  $O$  is the midpoint of  $\overline{HA}$ ;  $\angle 1 \cong \angle 2$

**Prove:**  $\angle 3 \cong \angle 4$

**Proof:**

Statements	Reasons
1. $O$ is the midpoint of $\overline{HA}$	1. Given
2. $\overline{HO} \cong \overline{AO}$	2. Midpoint Theorem
3.	3. Given



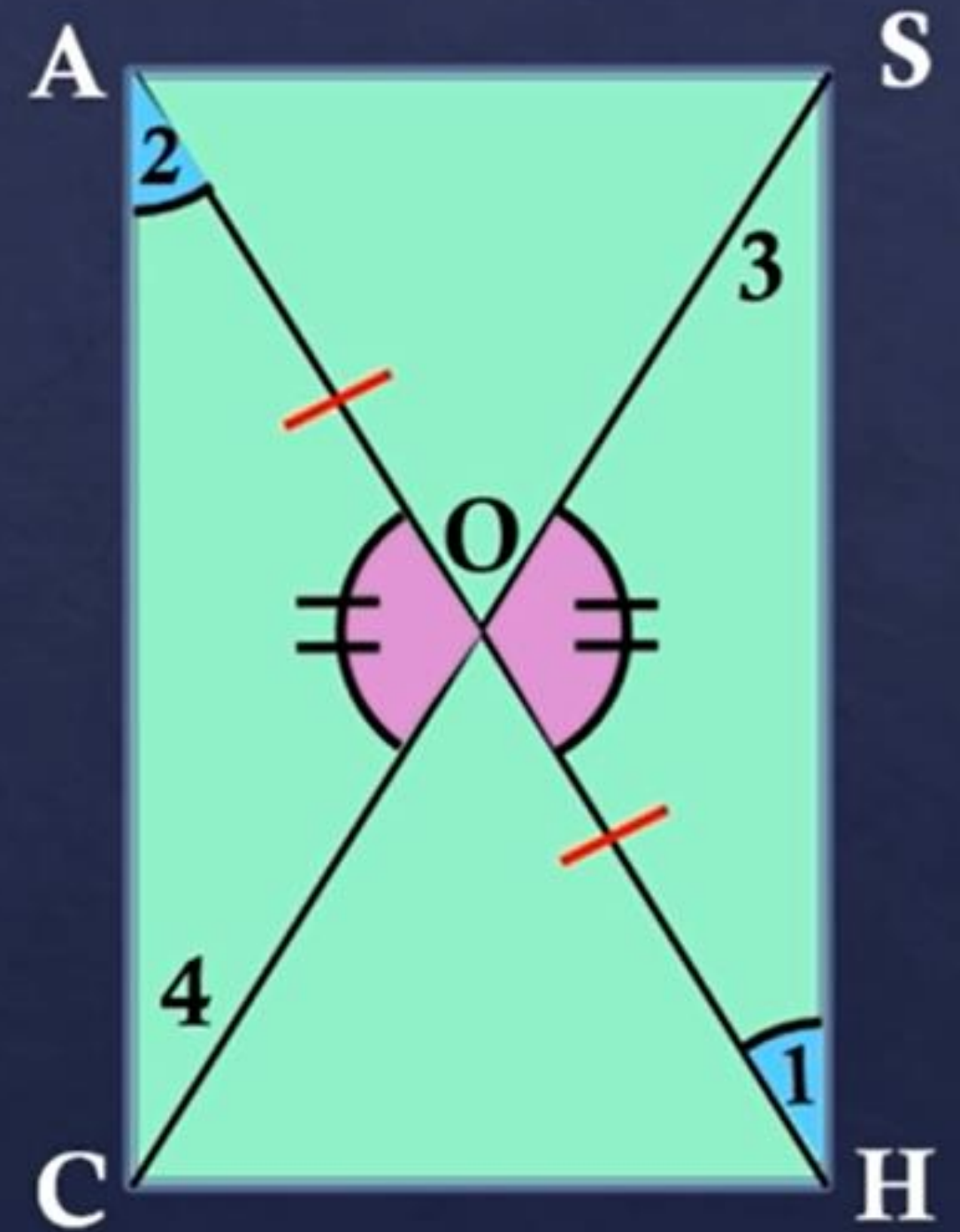
Example No. 4

**Given:**  $O$  is the midpoint of  $\overline{HA}$ ;  $\angle 1 \cong \angle 2$

**Prove:**  $\angle 3 \cong \angle 4$

**Proof:**

Statements	Reasons
1. $O$ is the midpoint of $\overline{HA}$	1. Given
2. $\overline{HO} \cong \overline{AO}$	2. Midpoint Theorem
3. $\angle 1 \cong \angle 2$	3. Given
4. $\angle COA \cong \angle SOH$	4. Vertical angles are congruent
5. $\triangle COA \cong \triangle SOH$	5. ASA Congruence Post.



Example No. 4

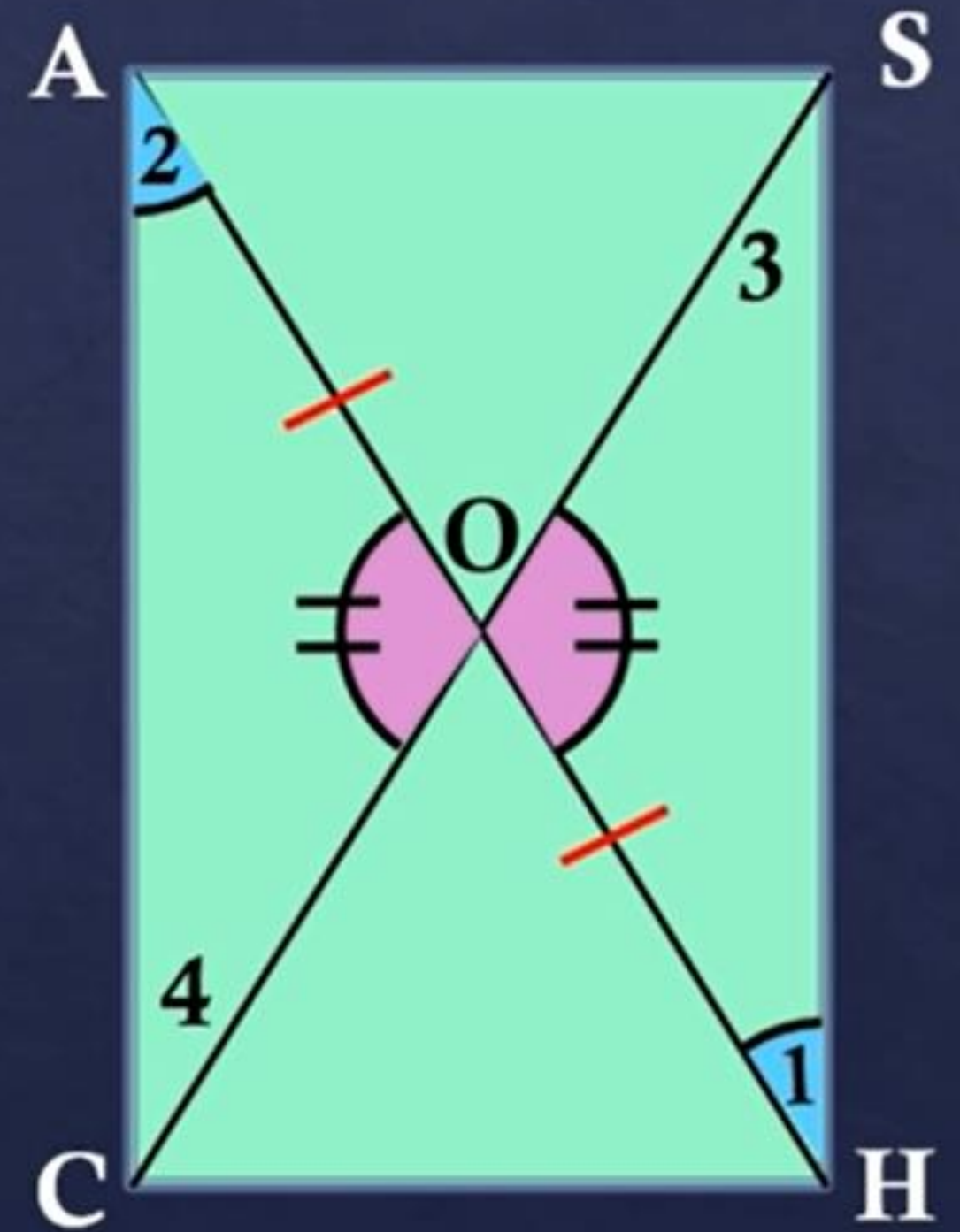


**Given:**  $O$  is the midpoint of  $\overline{HA}$ ;  $\angle 1 \cong \angle 2$

**Prove:**  $\angle 3 \cong \angle 4$

**Proof:**

Statements	Reasons
1. $O$ is the midpoint of $\overline{HA}$	1. Given
2. $\overline{HO} \cong \overline{AO}$	2. Midpoint Theorem
3. $\angle 1 \cong \angle 2$	3. Given
4. $\angle COA \cong \angle SOH$	4. Vertical angles are congruent
5. $\triangle COA \cong \triangle SOH$	5. ASA Congruence Post.
6. $\angle 3 \cong \angle 4$	6. CPCTC



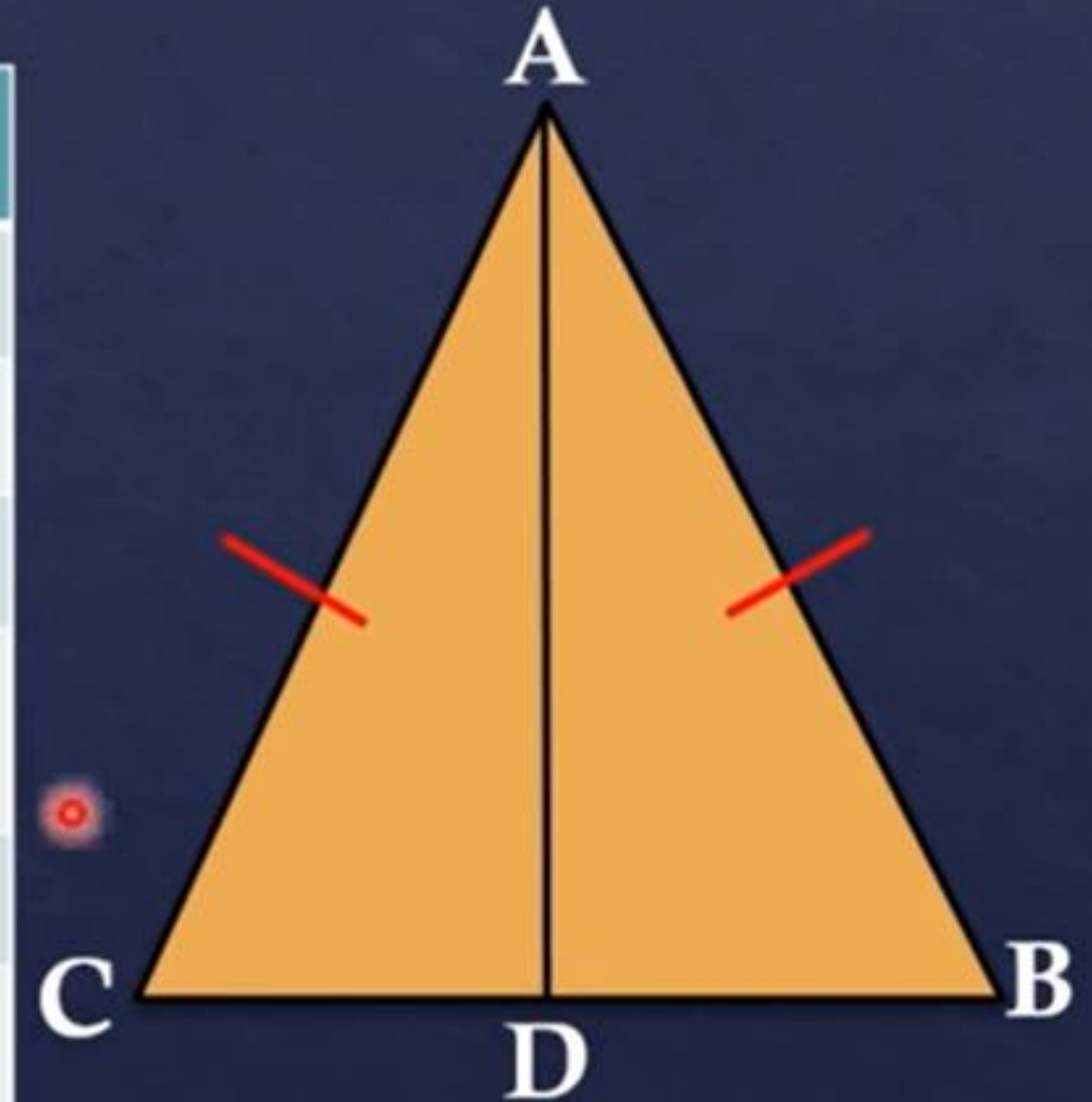
Example No. 4

**Given:**  $ABC$  is an isosceles triangle,  $\overline{AD}$  is the median of  $\triangle ABC$

**Prove:**  $\angle CAD \cong \angle BAD$

**Proof:**

Statements	Reasons
1. $ABC$ is an isosceles $\triangle$	1. Given
2. $\overline{AB} \cong \overline{AC}$	2. Definition of Isosceles $\triangle$
3. $\overline{AD}$ is the median of $\triangle ABC$	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.



Example No. 5

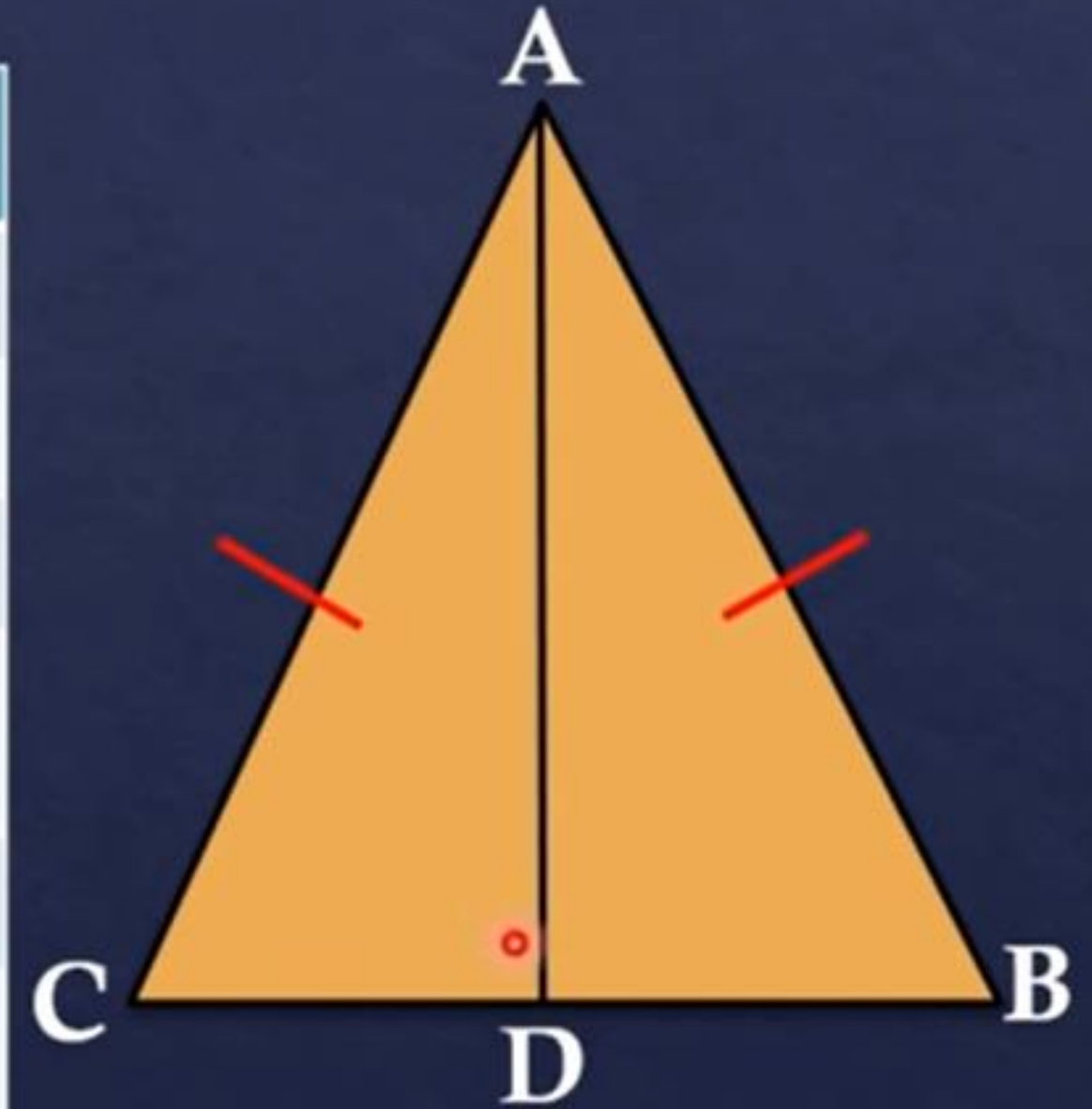


**Given:**  $ABC$  is an isosceles triangle,  $\overline{AD}$  is the median of  $\triangle ABC$

**Prove:**  $\angle CAD \cong \angle BAD$

**Proof:**

Statements	Reasons
1. $ABC$ is an isosceles $\triangle$	1. Given
2. $\overline{AB} \cong \overline{AC}$	2. Definition of Isosceles $\triangle$
3. $\overline{AD}$ is the median of $\triangle ABC$	3. Given
4. $D$ is the midpoint of $\overline{BC}$	4. Definition of Median of a Triangle
5.	5.
6.	6.
7.	7.
8.	8.



Example No. 5

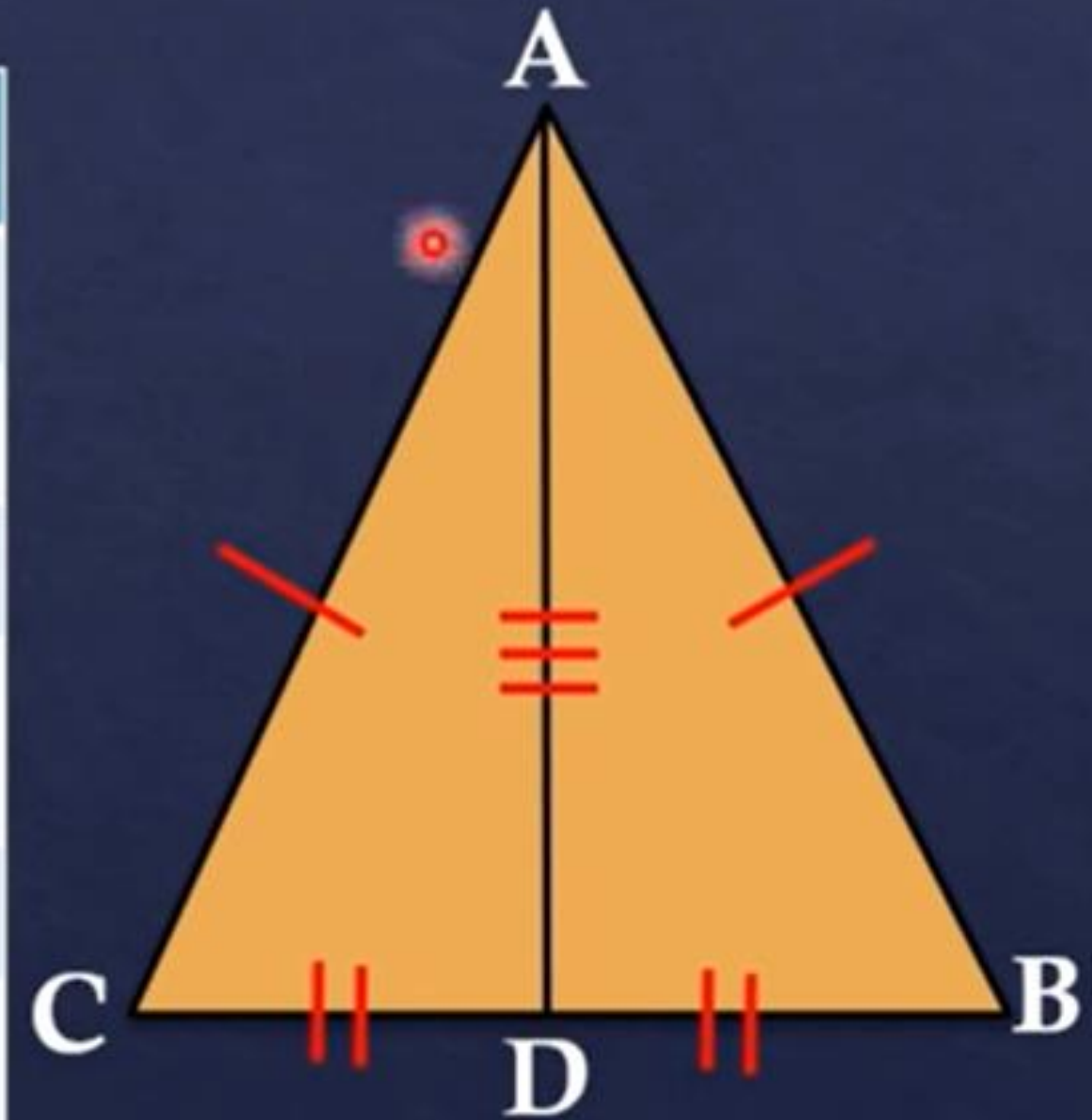


**Given:**  $ABC$  is an isosceles triangle,  $\overline{AD}$  is the median of  $\triangle ABC$

**Prove:**  $\angle CAD \cong \angle BAD$

**Proof:**

Statements	Reasons
1. $ABC$ is an isosceles $\triangle$	1. Given
2. $\overline{AB} \cong \overline{AC}$	2. Definition of Isosceles $\triangle$
3. $\overline{AD}$ is the median of $\triangle ABC$	3. Given
4. $D$ is the midpoint of $\overline{BC}$	4. Definition of Median of a Triangle
5. $\overline{BD} \cong \overline{CD}$	5. Midpoint Theorem
6. $\overline{AD} \cong \overline{AD}$	6. Reflexive Property of Congruence
7.	7.
8.	8.



Example No. 5

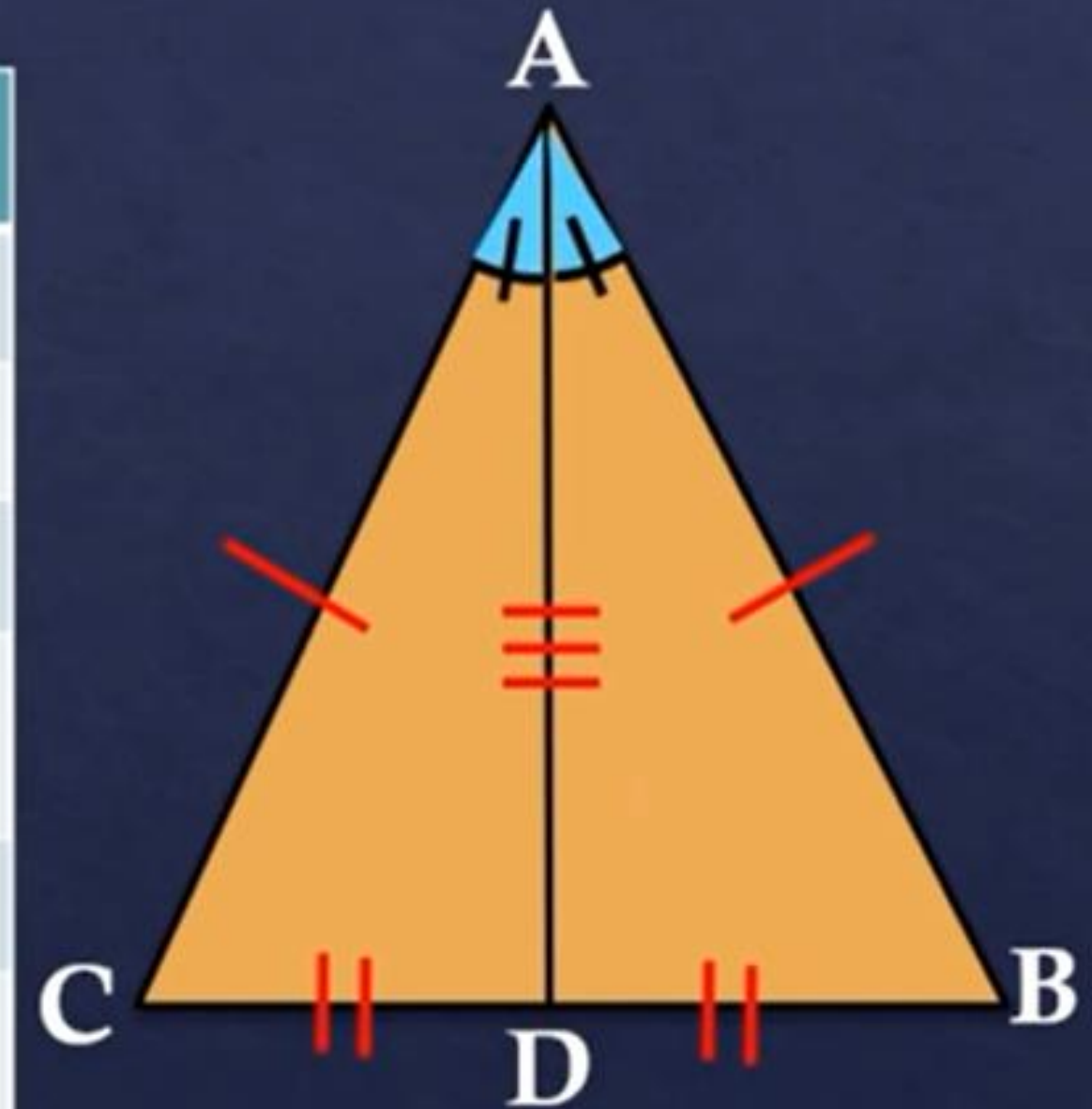


**Given:**  $ABC$  is an isosceles triangle,  $\overline{AD}$  is the median of  $\triangle ABC$

**Prove:**  $\angle CAD \cong \angle BAD$

**Proof:**

Statements	Reasons
1. $ABC$ is an isosceles $\triangle$	1. Given
2. $\overline{AB} \cong \overline{AC}$	2. Definition of Isosceles $\triangle$
3. $\overline{AD}$ is the median of $\triangle ABC$	3. Given
4. $D$ is the midpoint of $\overline{BC}$	4. Definition of Median of a Triangle
5. $\overline{BD} \cong \overline{CD}$	5. Midpoint Theorem
6. $\overline{AD} \cong \overline{AD}$	6. Reflexive Property of Congruence
7. $\triangle CAD \cong \triangle BAD$	7. SSS Congruence Post.
8. $\angle CAD \cong \angle BAD$	8. CPCTC



Example No. 5



**Given:**  $\overline{EN} \perp \overline{NB}$  ;  $\overline{EA} \perp \overline{AR}$   
 $\angle 1 \cong \angle 2$  ;  $\overline{EB} \cong \overline{ER}$

**Prove:**  $\triangle ENA$  is isosceles

**Proof:**

Statements	Reasons
1. $\overline{EN} \perp \overline{NB}$ ; $\overline{EA} \perp \overline{AR}$	1. Given
2. $\angle 3$ and $\angle 4$ are right angles	2. Perpendicular lines form right angles
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.



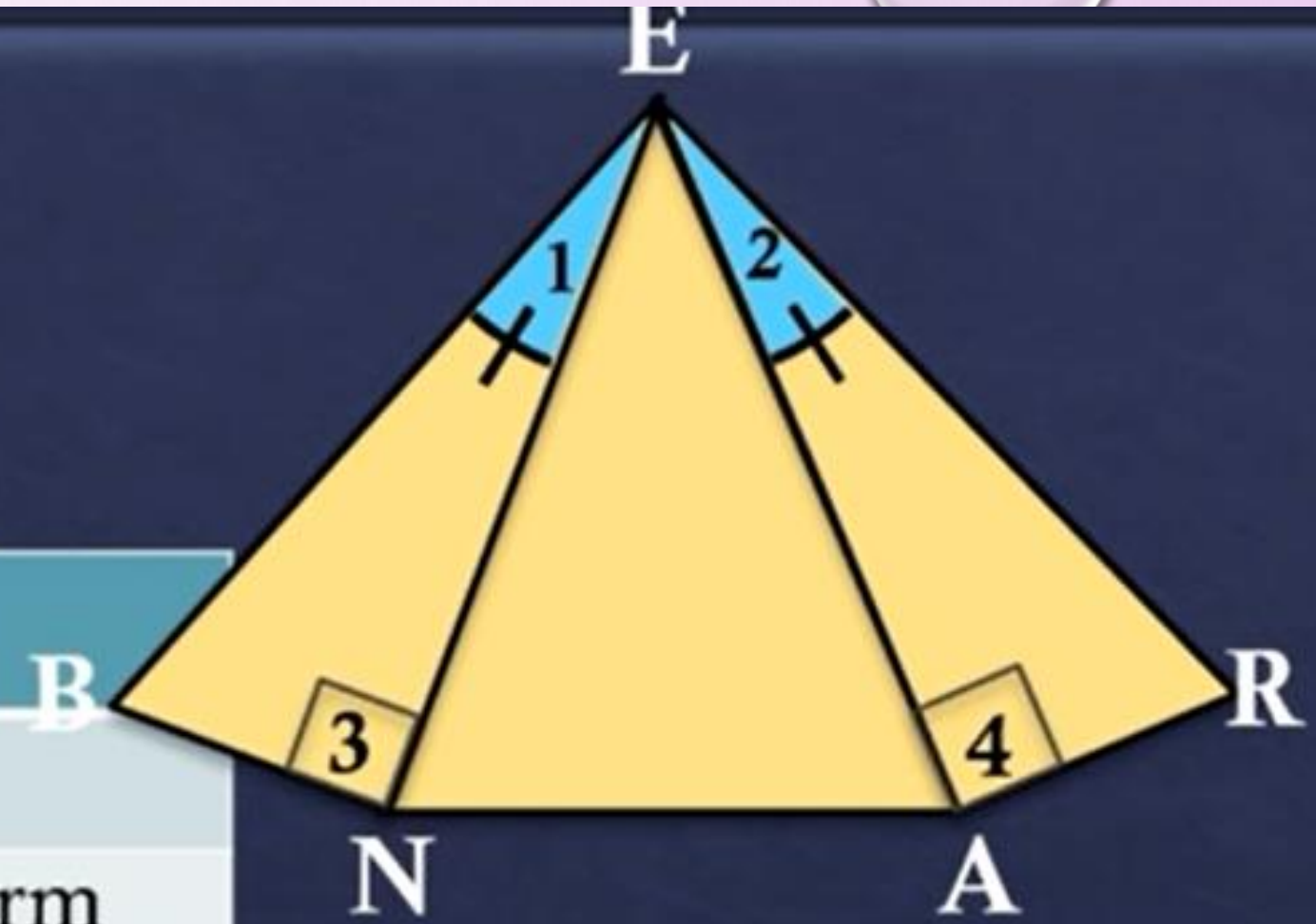
Example No. 6

**Given:**  $\overline{EN} \perp \overline{NB}$  ;  $\overline{EA} \perp \overline{AR}$   
 $\angle 1 \cong \angle 2$  ;  $\overline{EB} \cong \overline{ER}$

**Prove:**  $\triangle ENA$  is isosceles

**Proof:**

Statements	Reasons
1. $\overline{EN} \perp \overline{NB}$ ; $\overline{EA} \perp \overline{AR}$	1. Given
2. $\angle 3$ and $\angle 4$ are right angles	2. Perpendicular lines form right angles
3. $\triangle BNE$ and $\triangle RAE$ are right triangles	3. Definition of right triangles
4.	4.
5.	5.
6.	6.
7.	7.



Example No. 6



**Given:**  $\overline{EN} \perp \overline{NB}$  ;  $\overline{EA} \perp \overline{AR}$   
 $\angle 1 \cong \angle 2$  ;  $\overline{EB} \cong \overline{ER}$

**Prove:**  $\triangle ENA$  is isosceles

**Proof:**

Statements	Reasons
1. $\overline{EN} \perp \overline{NB}$ ; $\overline{EA} \perp \overline{AR}$	1. Given
2. $\angle 3$ and $\angle 4$ are right angles	2. Perpendicular lines form right angles
3. $\triangle BNE$ and $\triangle RAE$ are right triangles	3. Definition of right triangles
4. $\angle 1 \cong \angle 2$ ; $\overline{EB} \cong \overline{ER}$	4. Given
5. $rt.\triangle BNE \cong rt.\triangle RAE$	5. HA Congruence Theorem
6. $\overline{EN} \cong \overline{EA}$	6. CPCTC
7.	7.



Example No. 6



**Given:**  $\overline{EN} \perp \overline{NB}$  ;  $\overline{EA} \perp \overline{AR}$   
 $\angle 1 \cong \angle 2$  ;  $\overline{EB} \cong \overline{ER}$

**Prove:**  $\triangle ENA$  is isosceles

**Proof:**

Statements	Reasons
1. $\overline{EN} \perp \overline{NB}$ ; $\overline{EA} \perp \overline{AR}$	1. Given
2. $\angle 3$ and $\angle 4$ are right angles	2. Perpendicular lines form right angles
3. $\triangle BNE$ and $\triangle RAE$ are right triangles	3. Definition of right triangles
4. $\angle 1 \cong \angle 2$ ; $\overline{EB} \cong \overline{ER}$	4. Given
5. $rt.\triangle BNE \cong rt.\triangle RAE$	5. HA Congruence Theorem
6. $\overline{EN} \cong \overline{EA}$	6. CPCTC
7. $\triangle ENA$ is isosceles	7. Def. of Isosceles Triangle



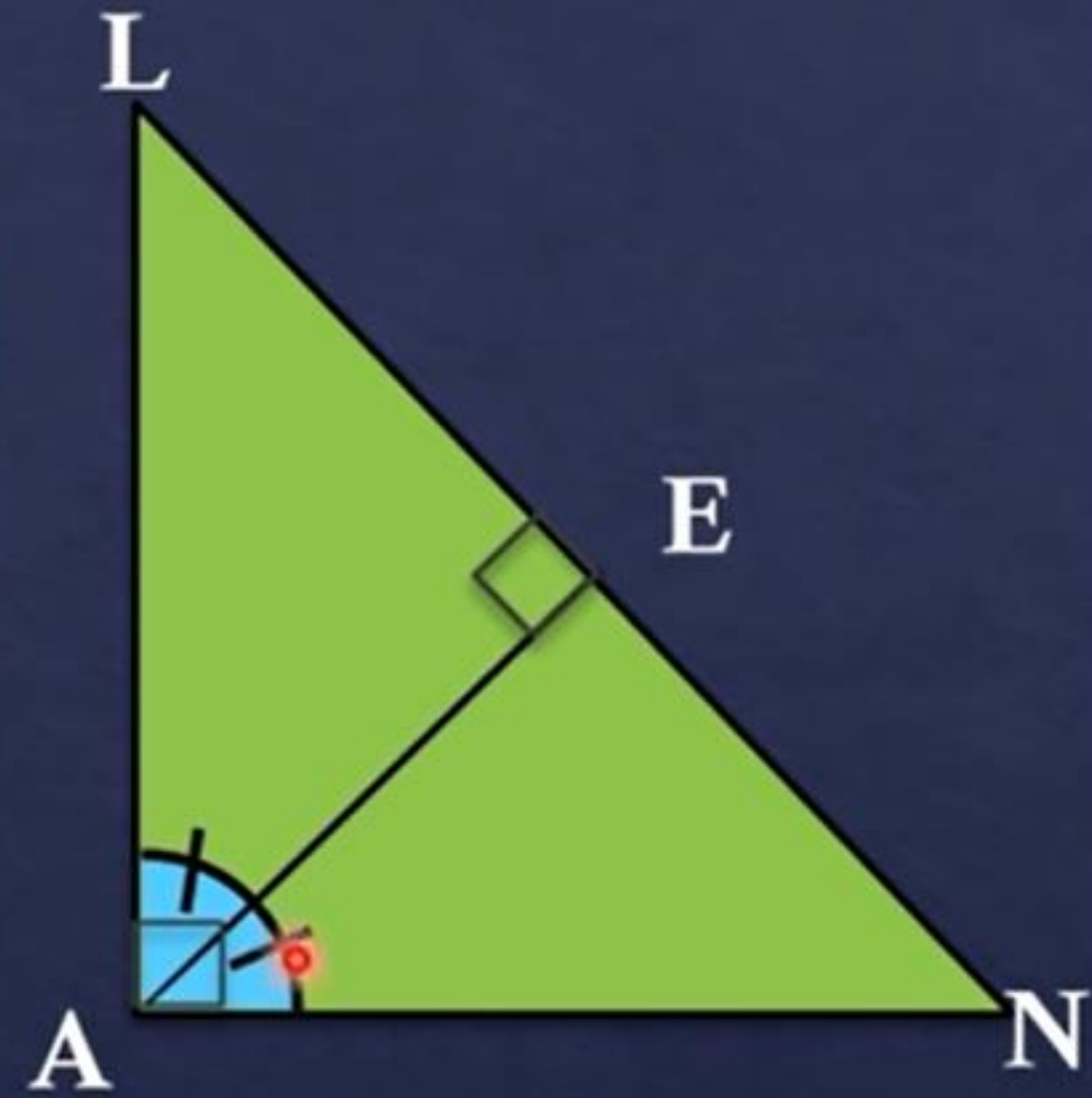
Example No. 6

**Given:**  $\overline{EA}$  bisects  $\angle LAN$  ;  $\overline{AE} \perp \overline{LN}$

**Prove:**  $\triangle LAN$  is isosceles

**Proof:**

Statements	Reasons
1. $\overline{EA}$ bisects $\angle LAN$	1. Given
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.



Example No. 7

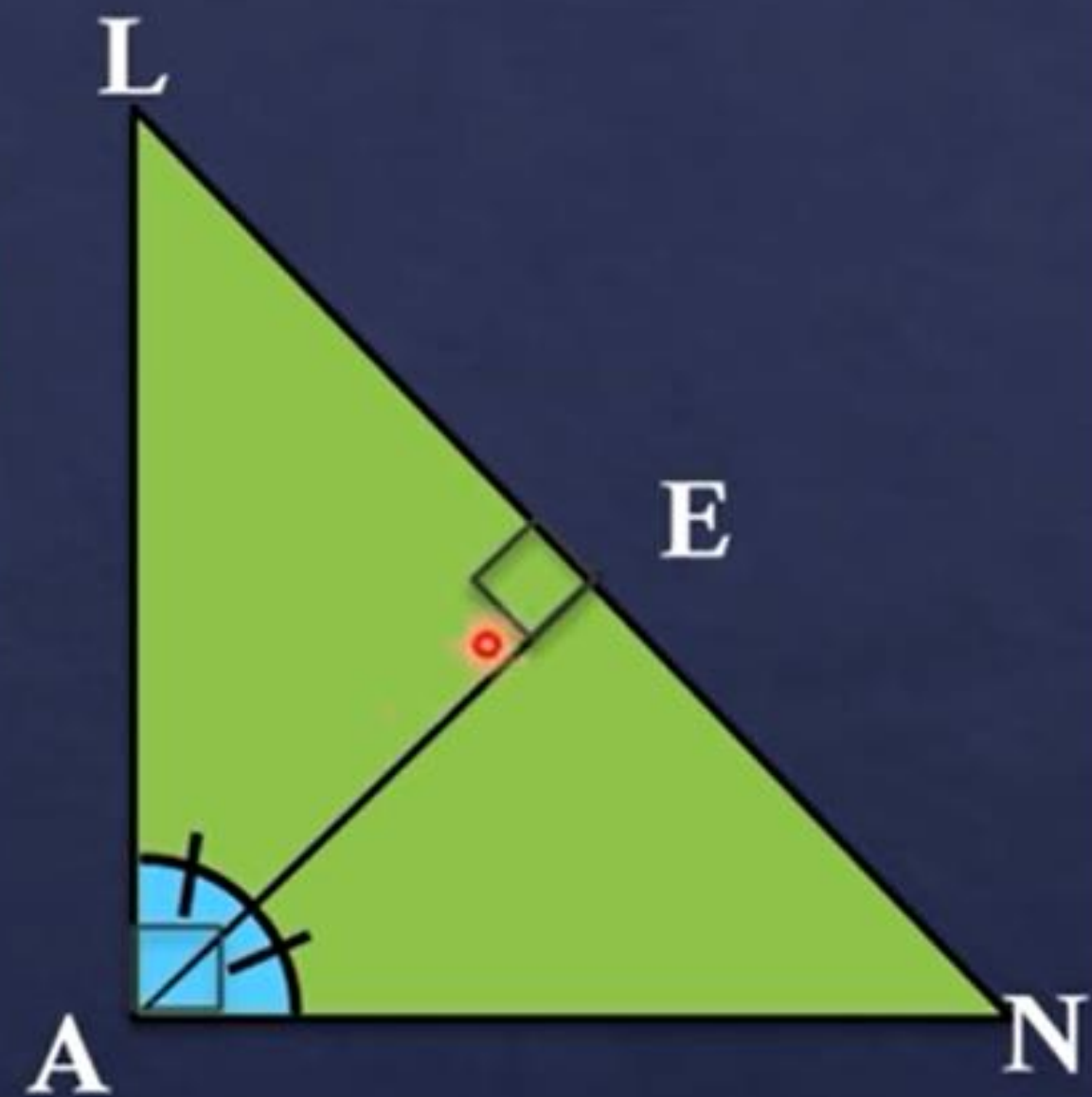


**Given:**  $\overline{EA}$  bisects  $\angle LAN$  ;  $\overline{AE} \perp \overline{LN}$

**Prove:**  $\triangle LAN$  is isosceles

**Proof:**

Statements	Reasons
1. $\overline{EA}$ bisects $\angle LAN$	1. Given
2. $\angle LAE \cong \angle NAE$	2. Definition of $\angle$ Bisector
3. $\overline{AE} \perp \overline{LN}$	3. Given
4. $\angle LEA$ and $\angle NEA$ are right angles	4. Perpendicular lines form right angles
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.



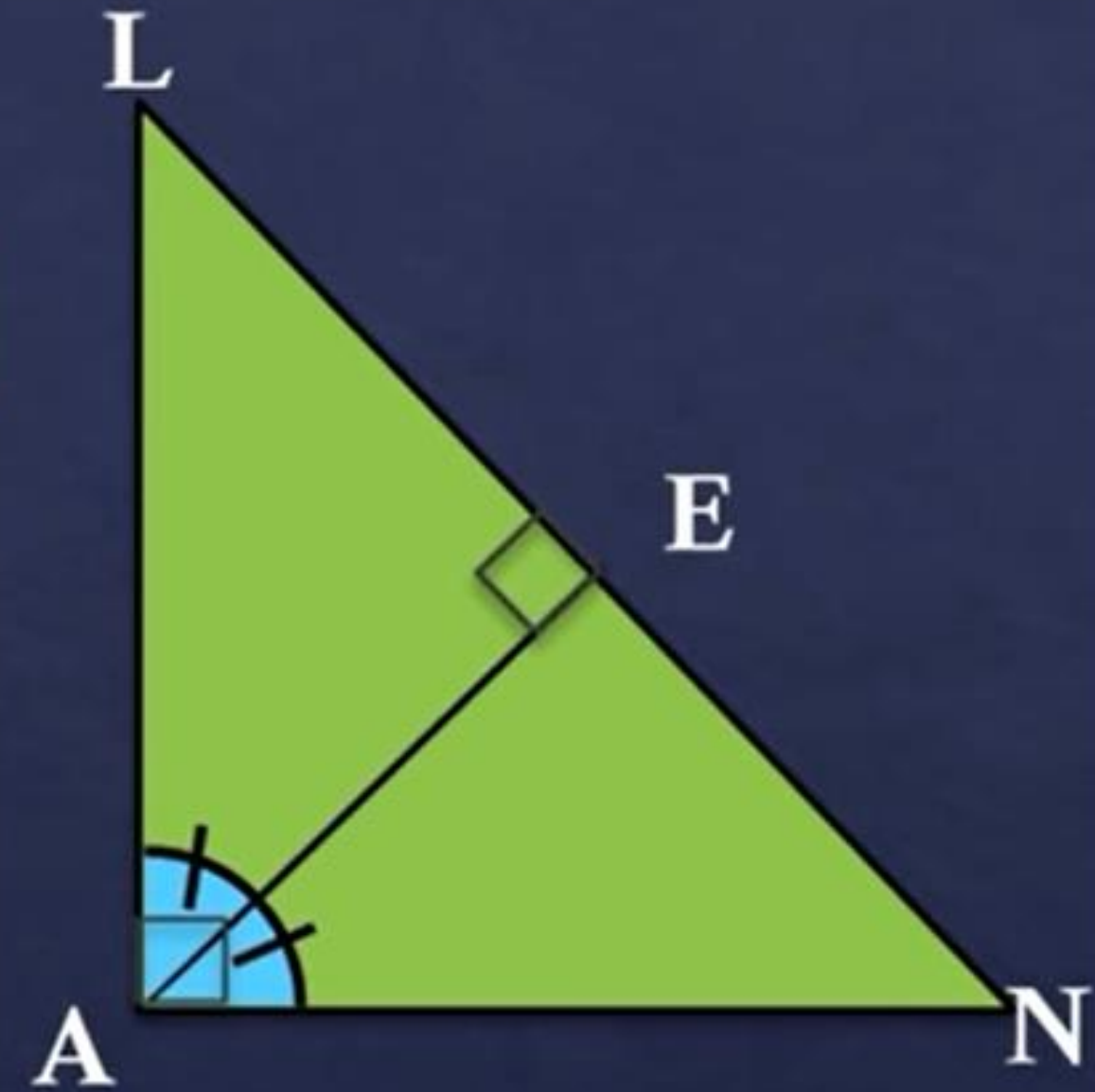
Example No. 7

**Given:**  $\overline{EA}$  bisects  $\angle LAN$  ;  $\overline{AE} \perp \overline{LN}$

**Prove:**  $\triangle LAN$  is isosceles

**Proof:**

Statements	Reasons
1. $\overline{EA}$ bisects $\angle LAN$	1. Given
2. $\angle LAE \cong \angle NAE$	2. Definition of $\angle$ Bisector
3. $\overline{AE} \perp \overline{LN}$	3. Given
4. $\angle LEA$ and $\angle NEA$ are right angles	4. Perpendicular lines form right angles
5. $\triangle LEA$ and $\triangle NEA$ are right $\triangle$ 's	5. Def. of right triangles
6.	6.
7.	7.
8.	8.
9.	9.



Example No. 7

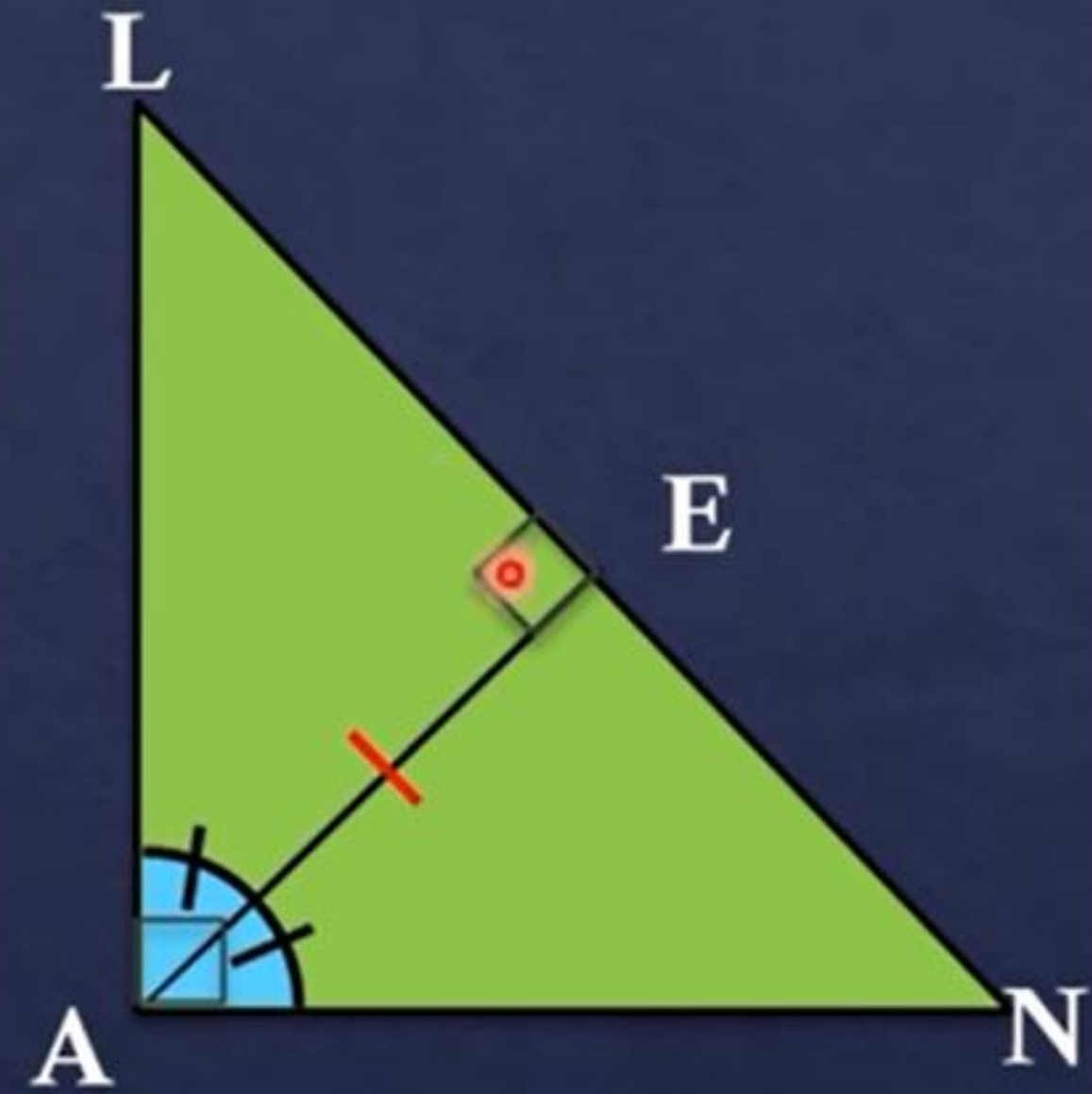


**Given:**  $\overline{EA}$  bisects  $\angle LAN$  ;  $\overline{AE} \perp \overline{LN}$

**Prove:**  $\triangle LAN$  is isosceles

**Proof:**

Statements	Reasons
1. $\overline{EA}$ bisects $\angle LAN$	1. Given
2. $\angle LAE \cong \angle NAE$	2. Definition of $\angle$ Bisector
3. $\overline{AE} \perp \overline{LN}$	3. Given
4. $\angle LEA$ and $\angle NEA$ are right angles	4. Perpendicular lines form right angles
5. $\triangle LEA$ and $\triangle NEA$ are right $\triangle$ 's	5. Def. of right triangles
6. $\overline{AE} \cong \overline{AE}$	6. Reflexive Property of Congruence
7.	7.
8.	8.
9.	9.



Example No. 7

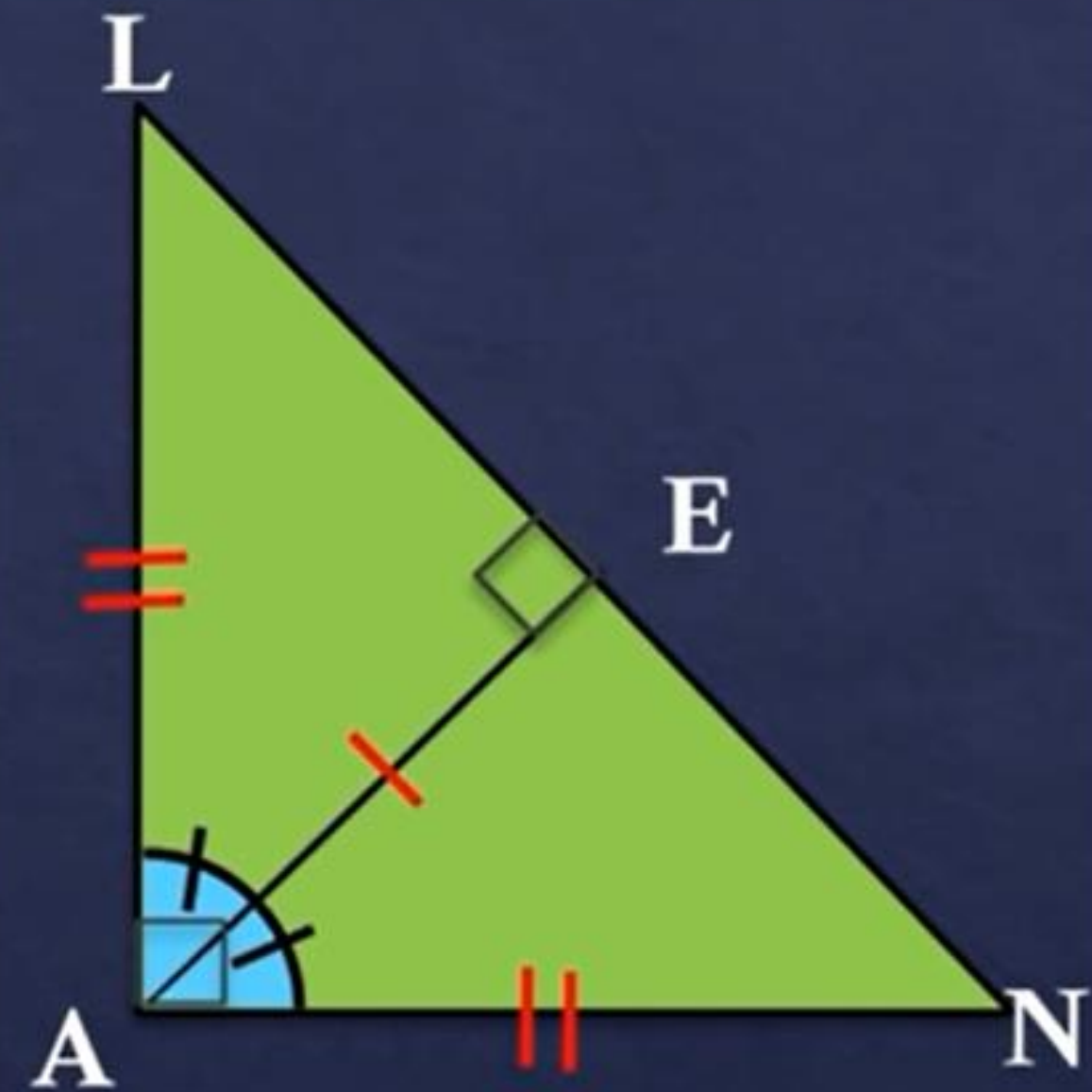


**Given:**  $\overline{EA}$  bisects  $\angle LAN$  ;  $\overline{AE} \perp \overline{LN}$

**Prove:**  $\triangle LAN$  is isosceles

**Proof:**

Statements	Reasons
1. $\overline{EA}$ bisects $\angle LAN$	1. Given
2. $\angle LAE \cong \angle NAE$	2. Definition of $\angle$ Bisector
3. $\overline{AE} \perp \overline{LN}$	3. Given
4. $\angle LEA$ and $\angle NEA$ are right angles	4. Perpendicular lines form right angles
5. $\triangle LEA$ and $\triangle NEA$ are right $\triangle$ 's	5. Def. of right triangles
6. $\overline{AE} \cong \overline{AE}$	6. Reflexive Property of Congruence
7. $rt.\triangle LEA \cong rt.\triangle NEA$	7. LA Congruence Theorem
8. $\overline{LA} \cong \overline{NA}$	8. CPCTC
9. $\triangle LAN$ is isosceles	9. Def. of Isosceles Triangle



Example No. 7

The background is white with several decorative elements. In the top left, there is a large white bubble and a pink triangle. In the top right, there is a large yellow triangle and a small white bubble. In the bottom left, there is a purple triangle. In the bottom right, there is a pink triangle and a small white bubble. A solid yellow horizontal bar is at the bottom of the image.

# **GROUP ACTIVITY: COMPLETE ME**

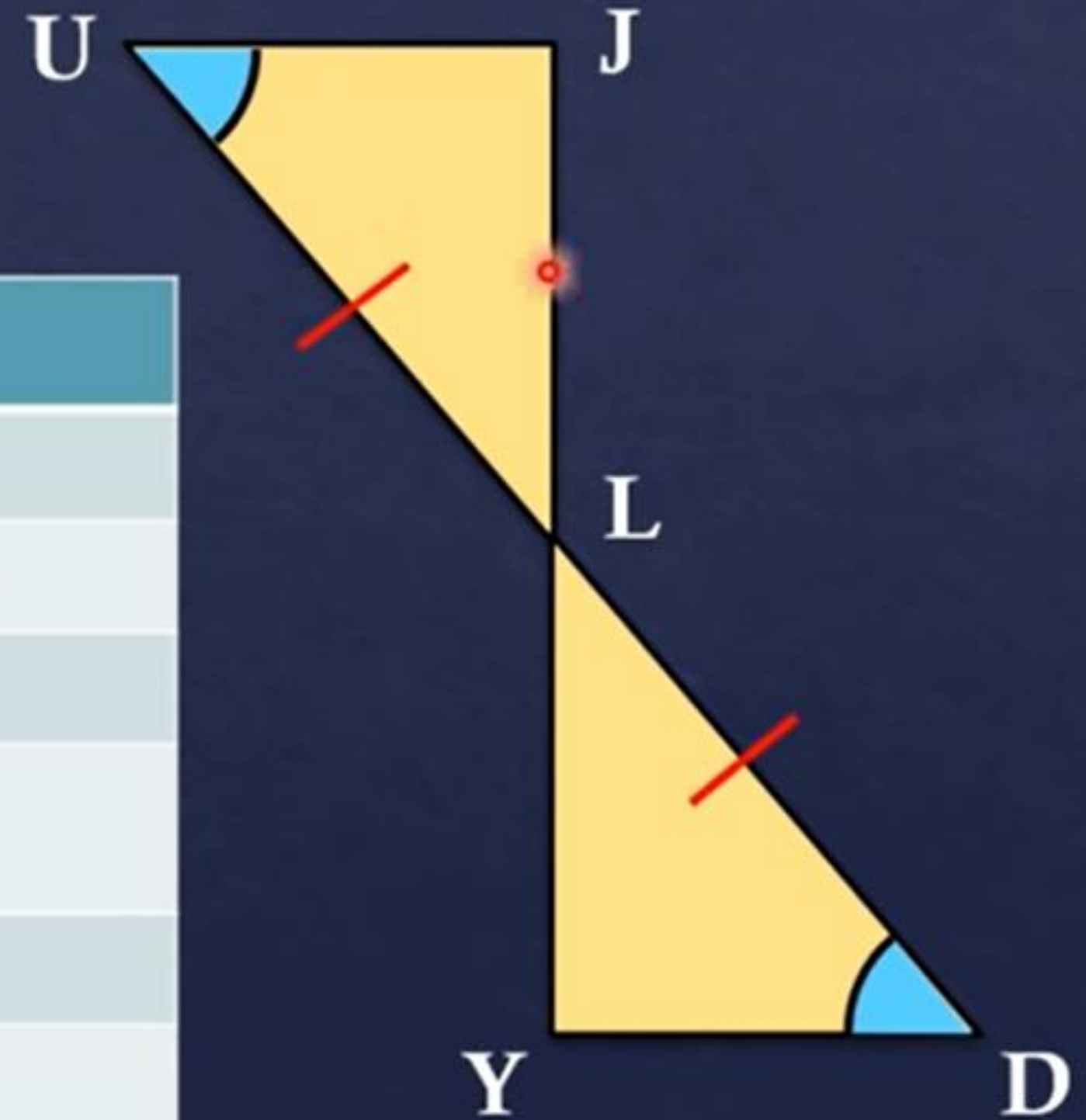


**Given:**  $L$  is the midpoint of  $\overline{UD}$ ;  $\angle U \cong \angle D$

**Prove:**  $\angle J \cong \angle Y$

**Proof:**

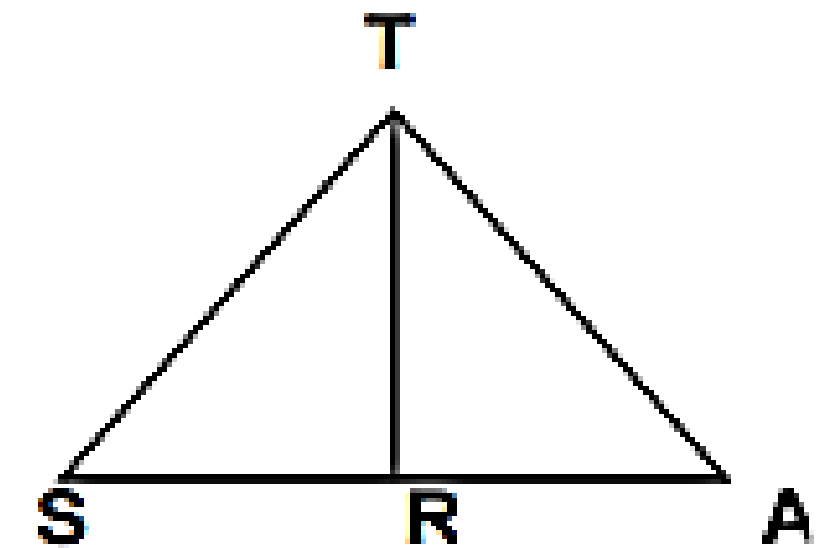
Statements	Reasons
1. $L$ is the midpoint of $\overline{UD}$	1. Given
2. $\overline{UL} \cong \overline{DL}$	2. Midpoint Theorem
3.	3.
4.	4.
5.	5.
6.	6.



Given: Isosceles  $\triangle STA$  with respect to the vertex  $\angle T$ ,  $\overline{AR} \cong \overline{SR}$

Prove:  $\angle ATR \cong \angle STR$

Proof:



Statements	Reasons
1. _____ (Which of the given statement will help the next statements)	1. Given
2. _____ (Which parts of the given triangle are congruent as defined by the isosceles triangle?)	2. Definition of Isosceles Triangle
3. _____ (Which side of $\triangle ATR$ and $\triangle STR$ is common?)	3. Reflexive Property



4. \_\_\_\_\_  
*(What other statement is given?)*

4. Given

5. \_\_\_\_\_  
*(What are the congruent triangles based on the previous statements)*

5. SSS Congruence Postulate

6. \_\_\_\_\_  
*(What other corresponding parts of the two triangles are to be proven congruent?)*

6. CPCTC

The background is a light purple gradient. It features several large, semi-transparent geometric shapes: a red triangle in the top-left, a yellow triangle in the top-right, a blue triangle in the bottom-left, and a red triangle in the bottom-right. Scattered throughout are small, realistic-looking bubbles of various sizes. The text 'THANK YOU' is centered in a bold, blue, sans-serif font.

**THANK  
YOU**