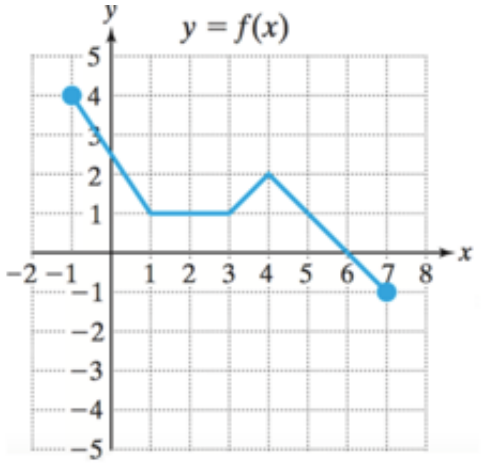
Created by Mr. Lischwe

Warmup 2/($4^2 + \sqrt{4} + 4^0$)

PLEASE GET A WHITEBOARD, MARKER, ERASER!!!



Domain: $-1 \le x \le 7$

Range: $-1 \le y \le 4$

Use the arithmetic recursive rule to find the first five terms:

$a_1 = 19$

$a_n = a_{n-1} - 11$

19, 8, -3, -14, -25

Find the slope between:
(–5,–4) and (–4, –5)

$\frac{-5 - -4}{-4 - -5} = \frac{-1}{1} = -1$

Solve the equation for *a*

$\frac{2}{5}(-10a + 5b) = d$

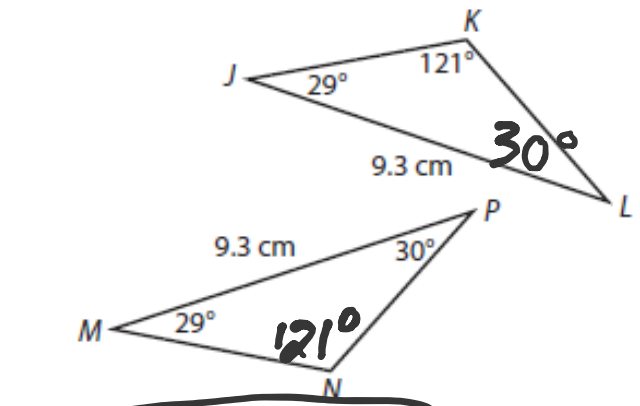
$-4a + 2b = d$

$-2b \quad -2b$

$\frac{-4a}{-4} = \frac{d - 2b}{-4}$

$a = -\frac{1}{4}d + \frac{1}{2}b$

3.



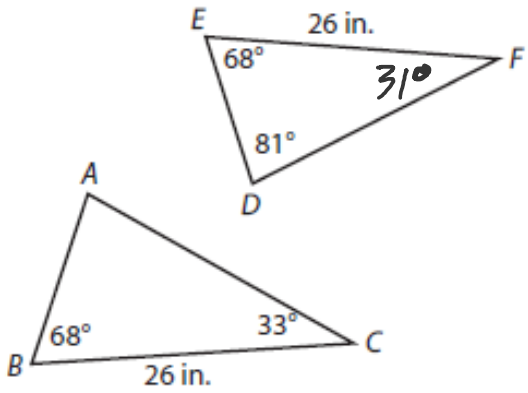
$29° + 121° + m\angle L = 180°$

$m\angle L = 30°$

$m\angle J = m\angle M$, $JL = MP$, and $m\angle L = m\angle P$. So $\angle J \cong \angle M$, $\overline{JL} \cong \overline{MP}$, and $\angle L \cong \angle P$. $\angle J$ and $\angle L$ include side $\overline{JL}$, and $\angle M$ and $\angle P$ include side $\overline{MP}$. Therefore, $\triangle JKL \cong \triangle MNP$ by ASA.

or AAS

4.



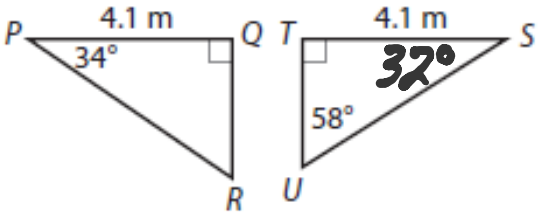
$81° + 68° + m\angle F = 180°$

$m\angle F = 31°$

None of the angles in $\triangle DEF$ has a measure of 33°. So, $\triangle DEF$ is not congruent to $\triangle ABC$.

Determine whether the triangles are congruent. Explain your reasoning.

5.

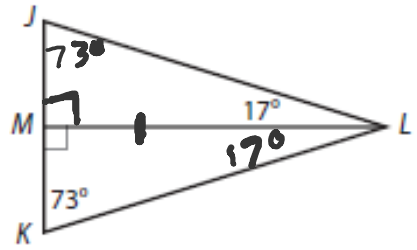


$m\angle S + 90° + 58° = 180°$

$m\angle S = 32°$

None of the angles in $\triangle STU$ has a measure of 34°. So, $\triangle STU$ is not congruent to $\triangle PQR$.

6.



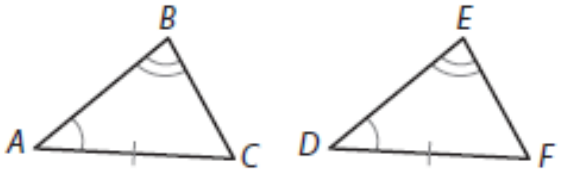
$m\angle LMK + m\angle K + m\angle MLK = 180°$

$163° + m\angle MLK = 180°$, so $m\angle KLM = 17°$

$m\angle JML = m\angle KML$, so $\angle JML \cong \angle KML$; $\overline{ML} \cong \overline{ML}$ by the Reflexive Property of Congruence; $m\angle MLJ = m\angle MLK$, so $\angle MLJ \cong \angle MLK$. $\angle JML$ and $\angle MLJ$ include side $\overline{ML}$, and $\angle KML$ and $\angle MLK$ include side $\overline{ML}$. Therefore $\triangle JML \cong \triangle KML$ by the ASA Triangle Congruence Theorem.

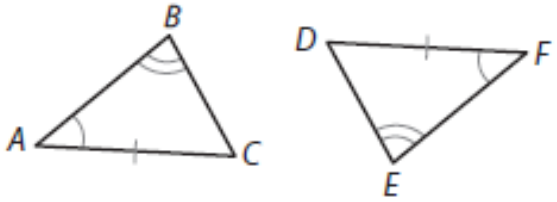
or AAS

1.



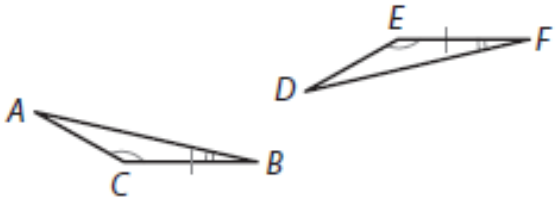
Congruent, by AAS Congruence

2.



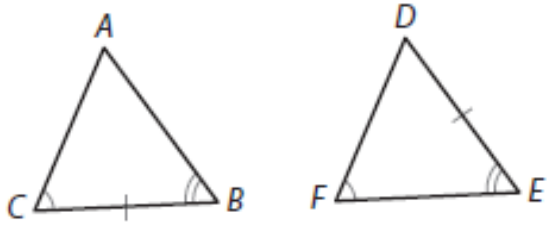
Congruent, by AAS Congruence

3.



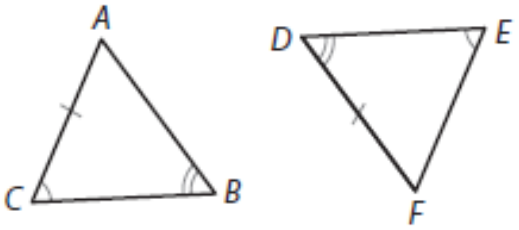
Congruent, by ASA Congruence

4.



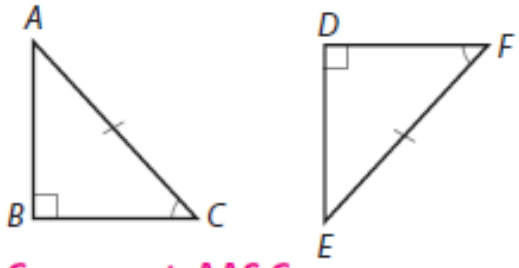
Cannot be determined.

5.



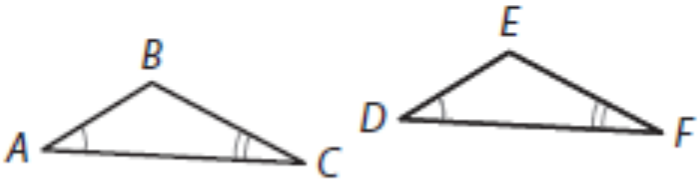
Cannot be determined.

6.



Congruent, AAS Congruence

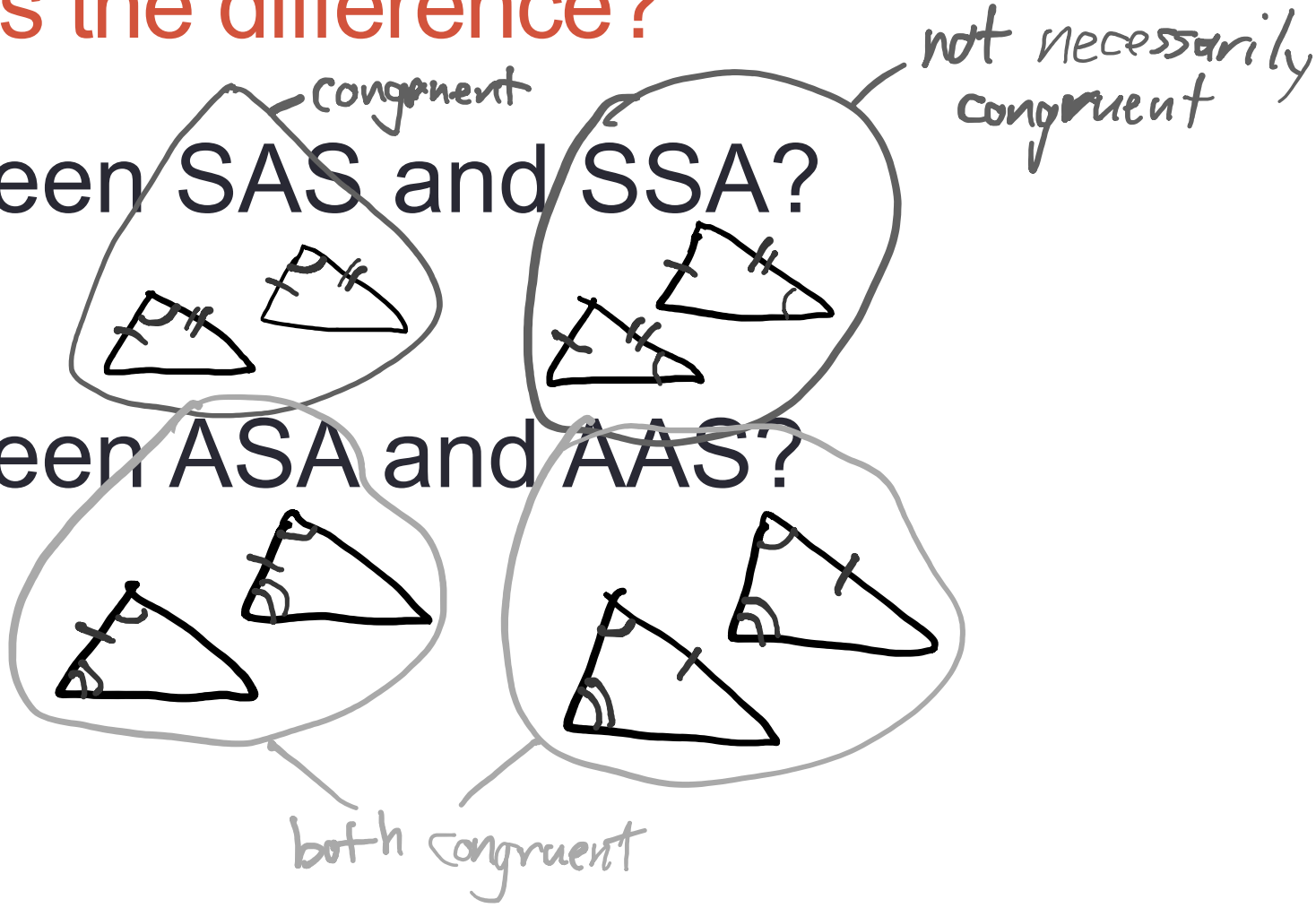
7.



$\overline{AB} \cong \overline{DE}$, or $\overline{BC} \cong \overline{EF}$

What is the difference?

- Between SAS and SSA?
- Between ASA and AAS?



A Video…

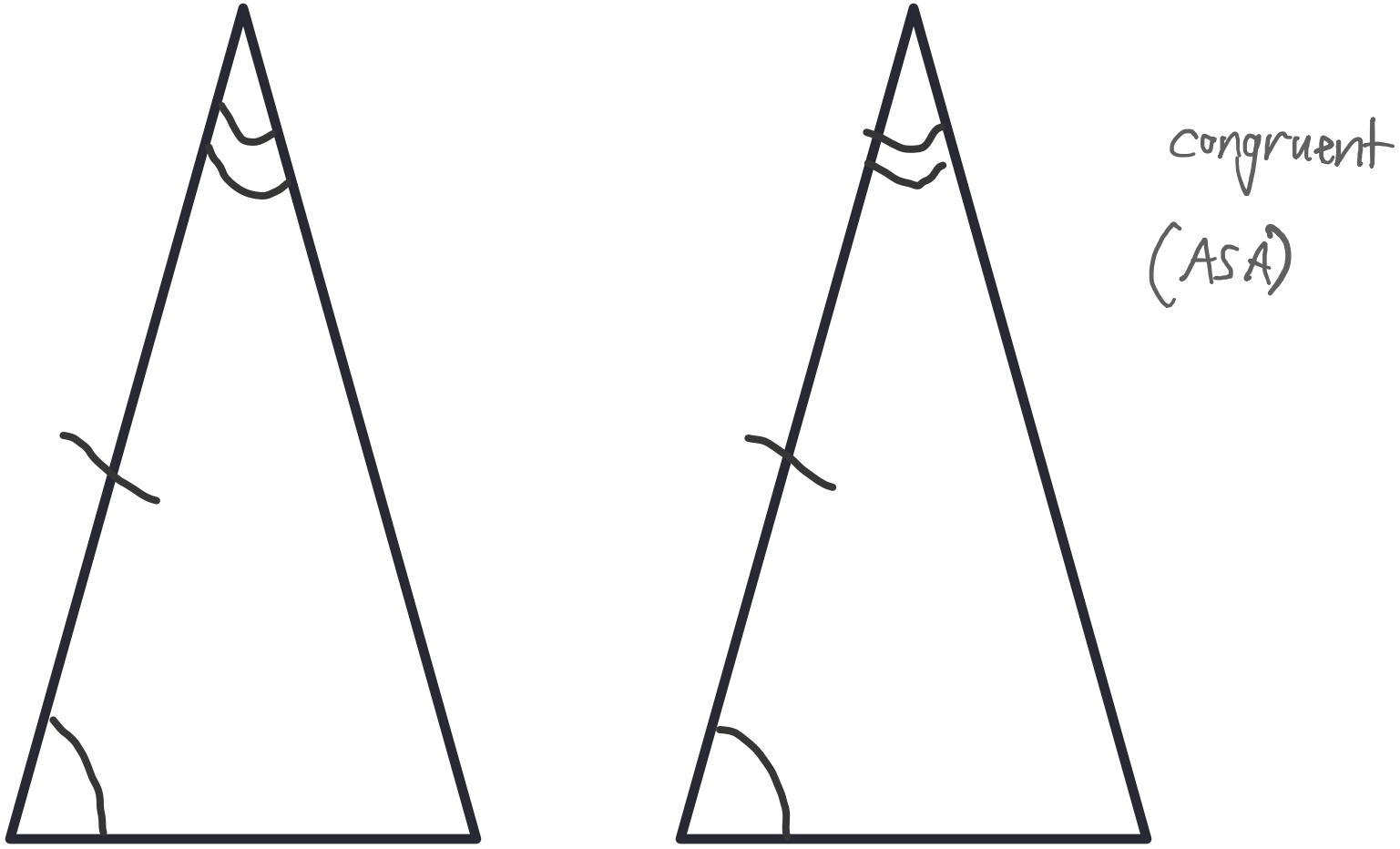
- https://www.khanacademy.org/math/geometry/congruence/triangle-congruence/v/more-on-why-ssa-is-not-a-postulate

On your whiteboards…

- Can the triangles be proved congruent? (Yes or No)
- State the reason (SSS, ASA, AAA, etc.)

- We will hold them up **ALL AT ONCE.**

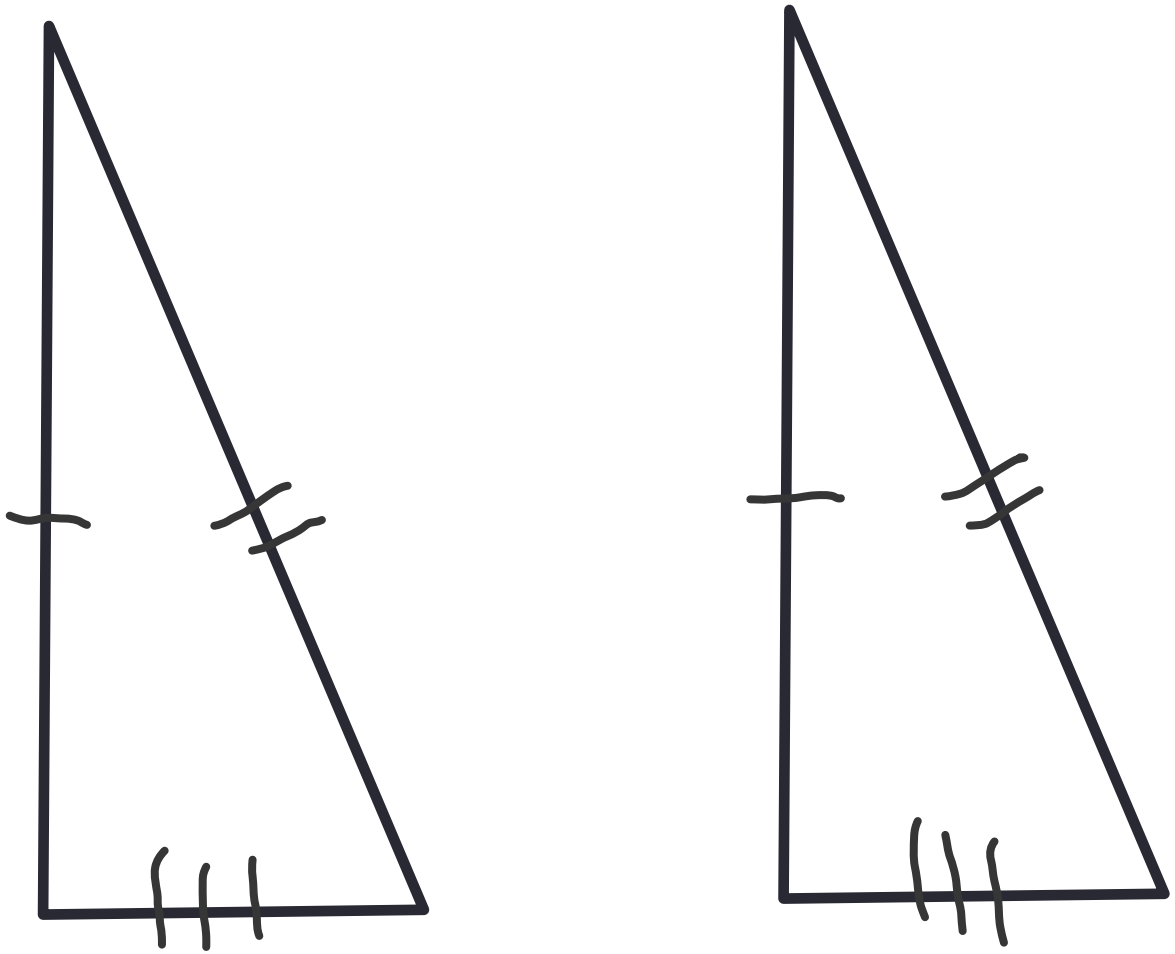
SSS, SAS, ASA, AAS, HL or none?



congruent

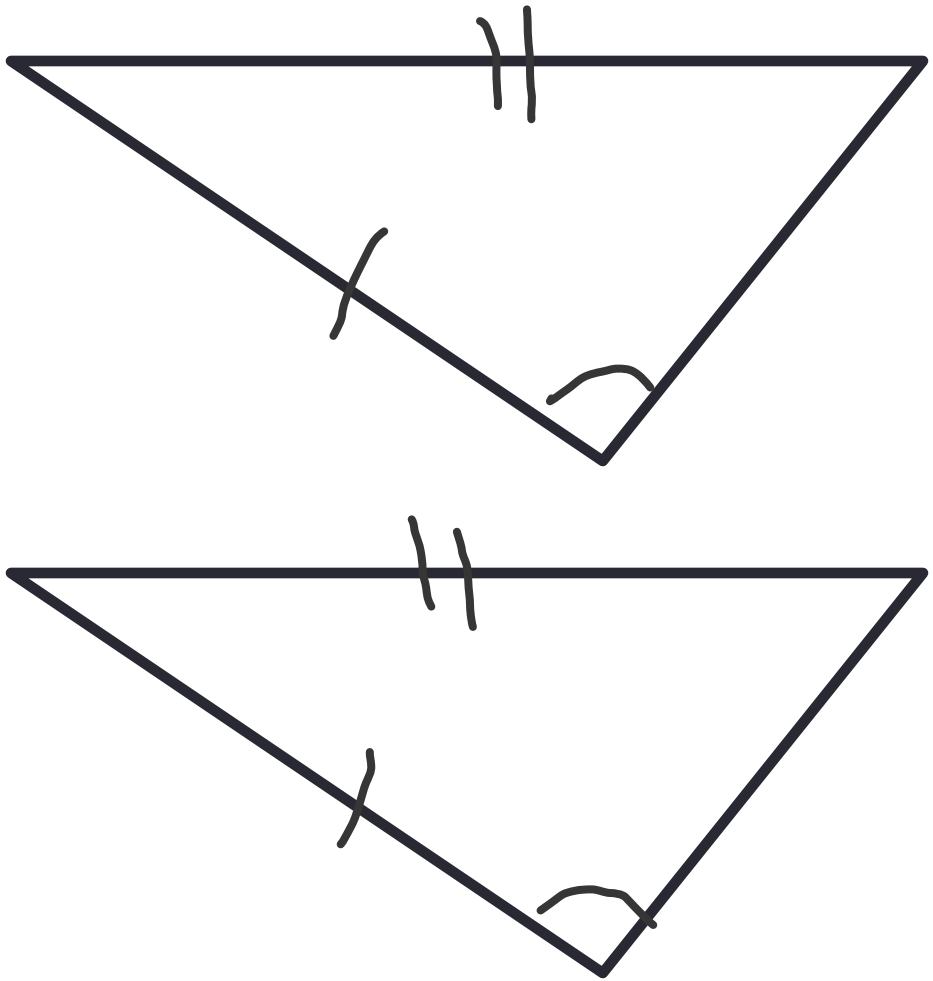
(ASA)

SSS, SAS, ASA, AAS, HL or none?



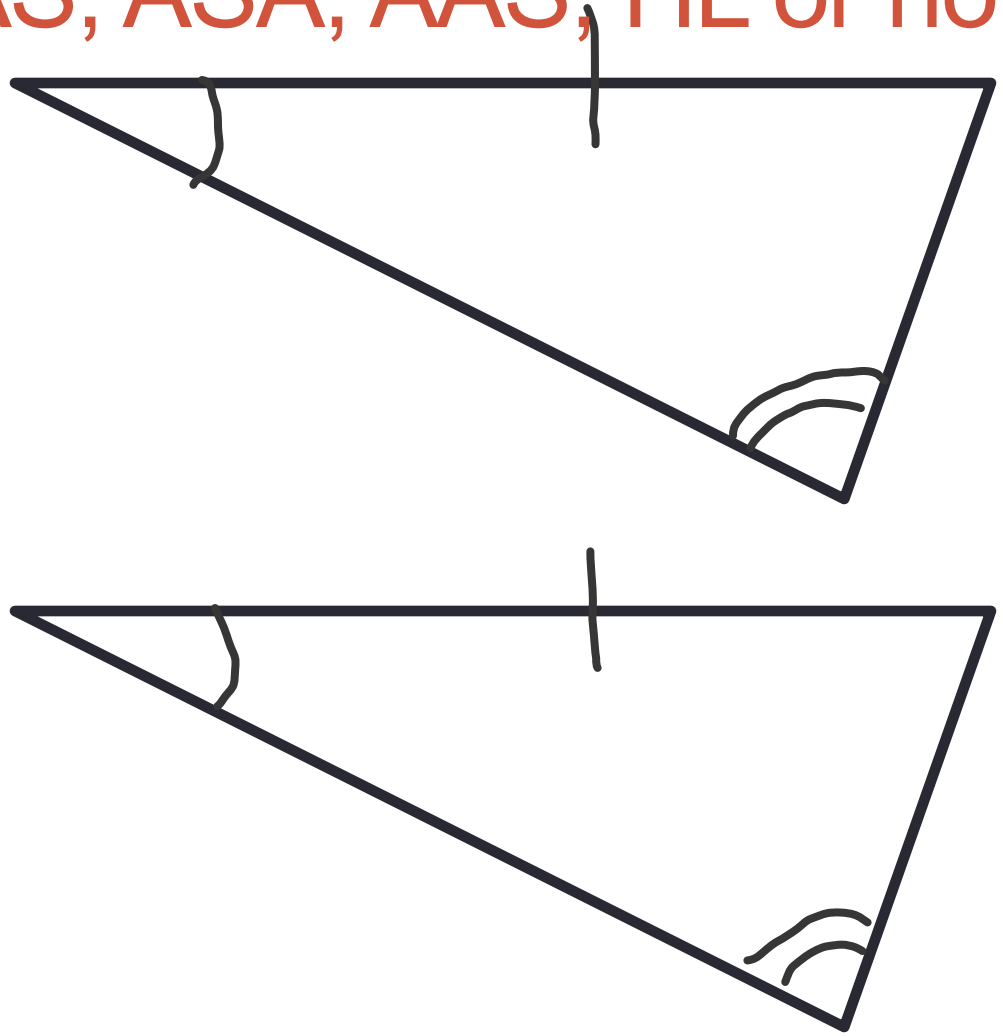
congruent
(SSS)

SSS, SAS, ASA, AAS, HL or none?



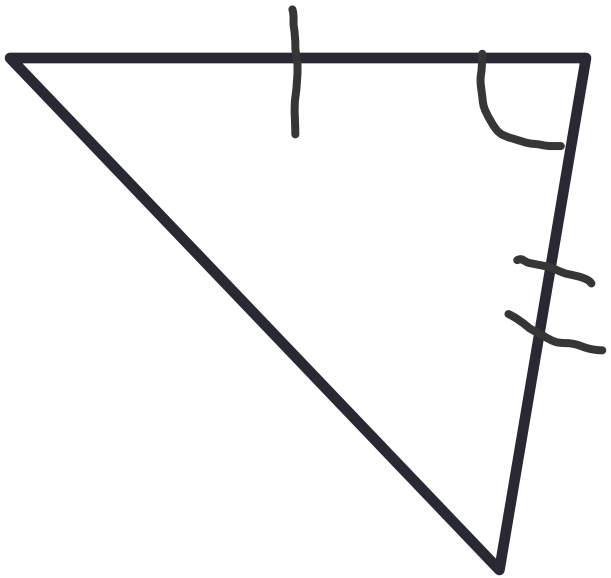
necessarily not Congruent (SSA)

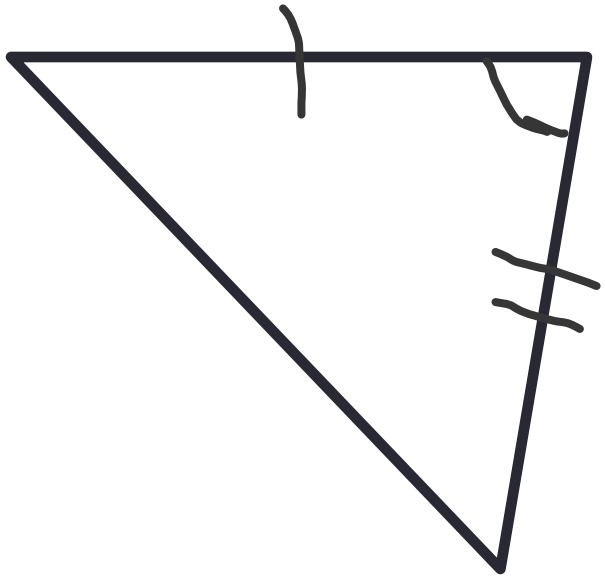
SSS, SAS, ASA, AAS, HL or none?



congruent
(AAS)

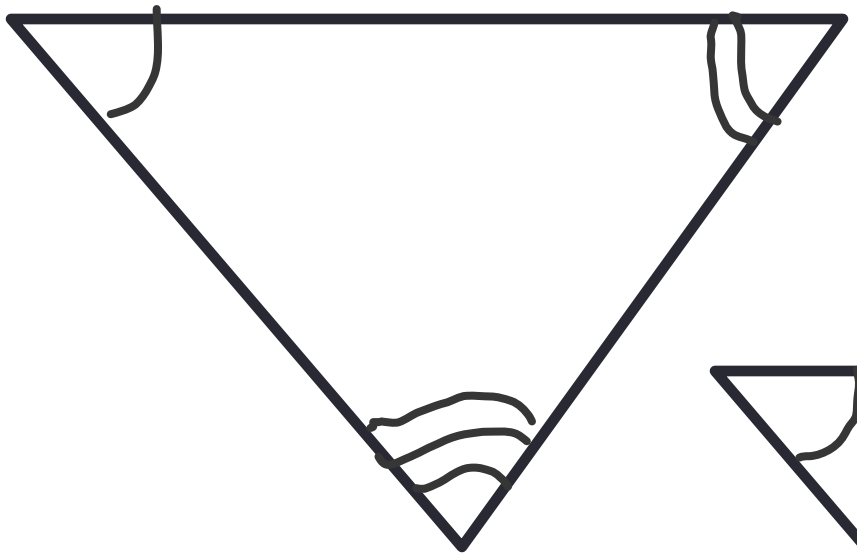
SSS, SAS, ASA, AAS, HL or none?



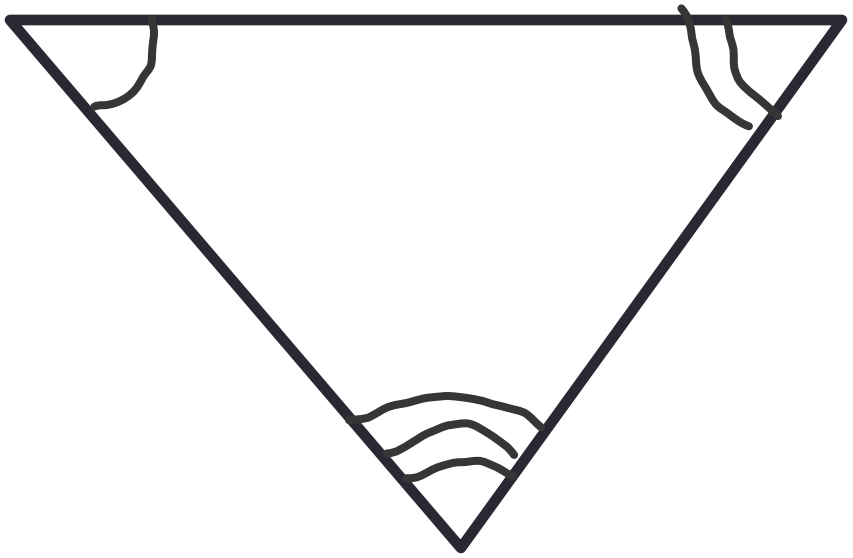


congruent
(SAS)

SSS, SAS, ASA, AAS, HL or none?

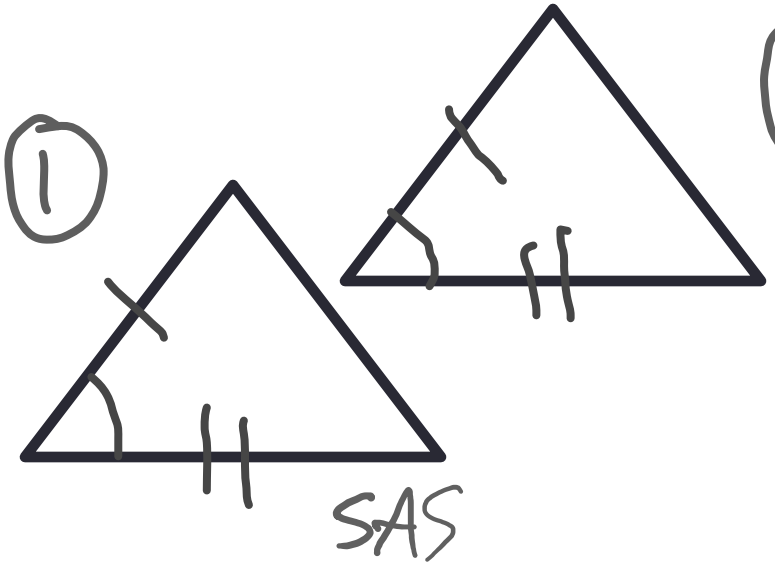


not necessarily congruent (AAA)

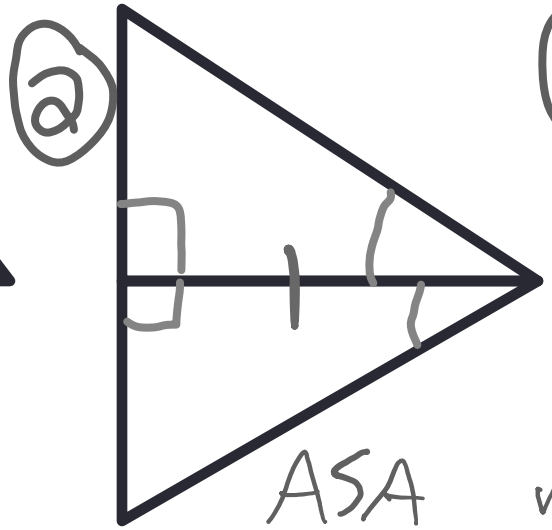


For 1-4, say which congruence shortcut you can use. If none, write none!

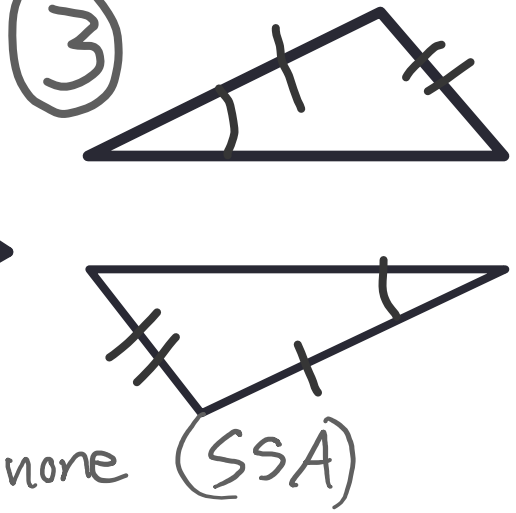
1



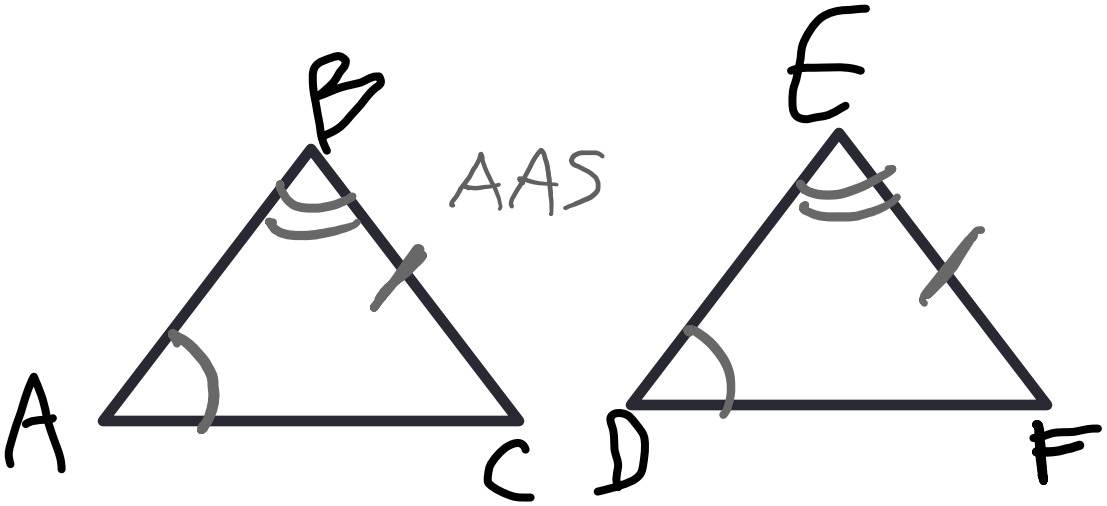
2



3

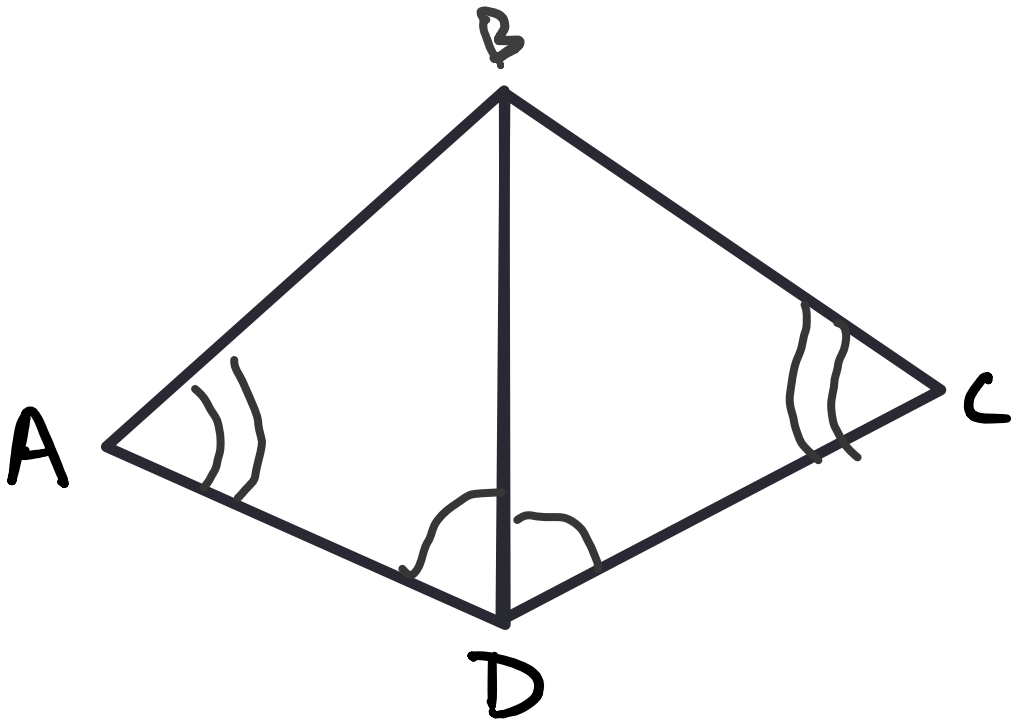


4



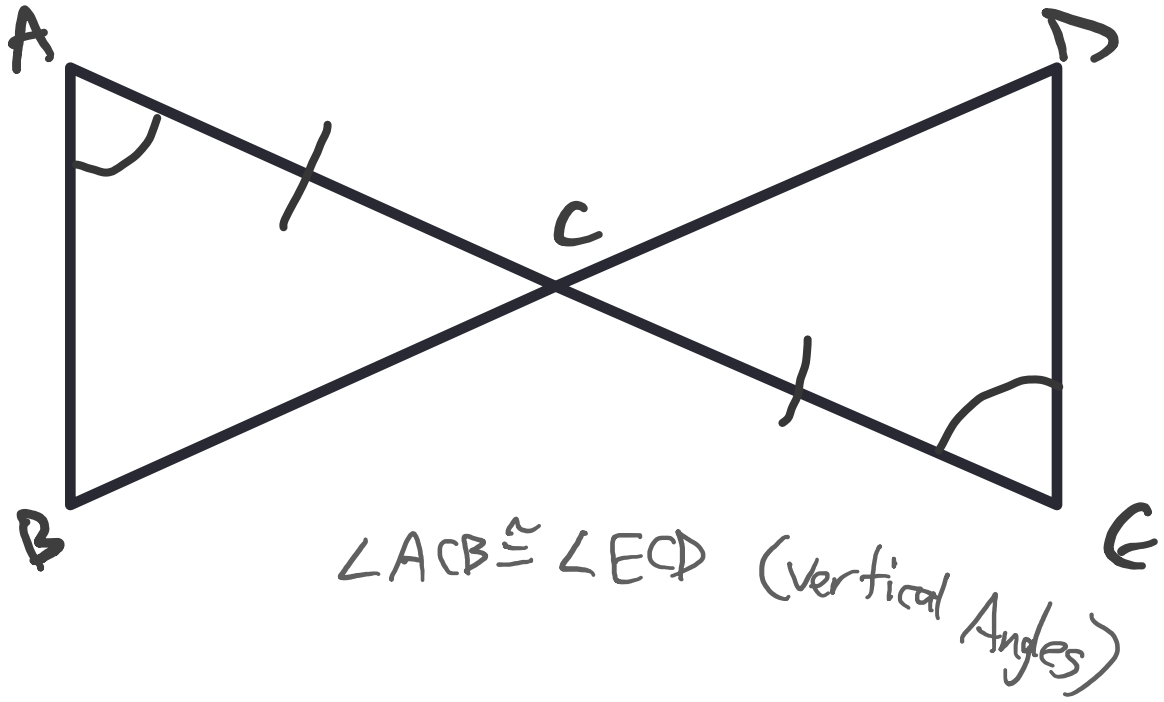
- Sometimes, there is more information than what is given in the diagram…

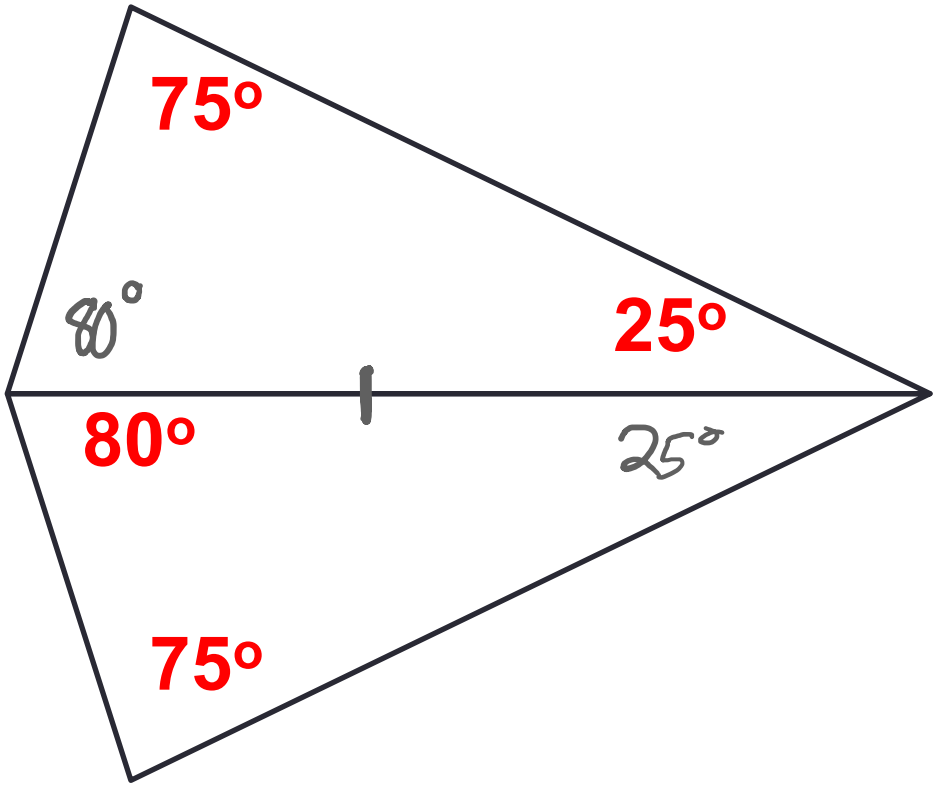
What can you add to the diagram?
State the reason.



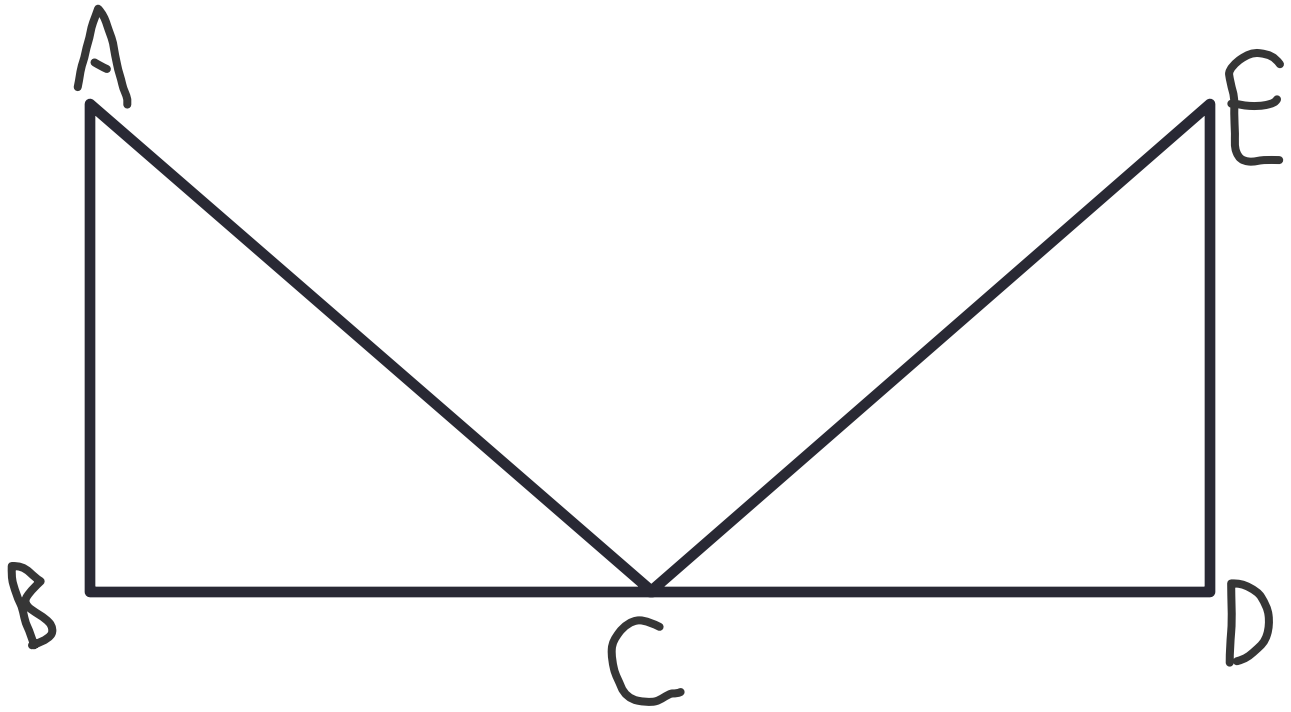
$\overline{BD} \cong \overline{BD}$ (Reflexive Property)

What can you add to the diagram?
State the reason.




75°
80°
25°
80°
25°
75°

What can you add to the diagram?
State the reason.

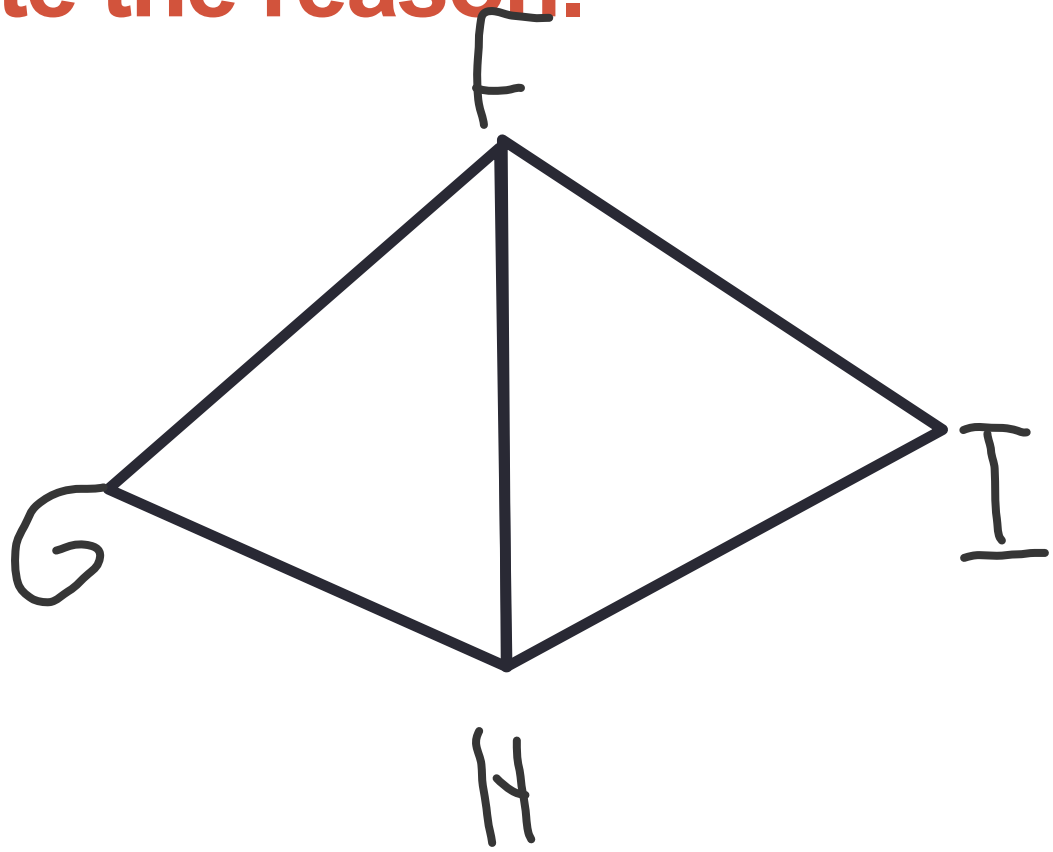


C is the midpoint of segment BD.

$\overline{BC} \cong \overline{DC}$ (Definition of midpoint)

What can you add to the diagram?

State the reason.

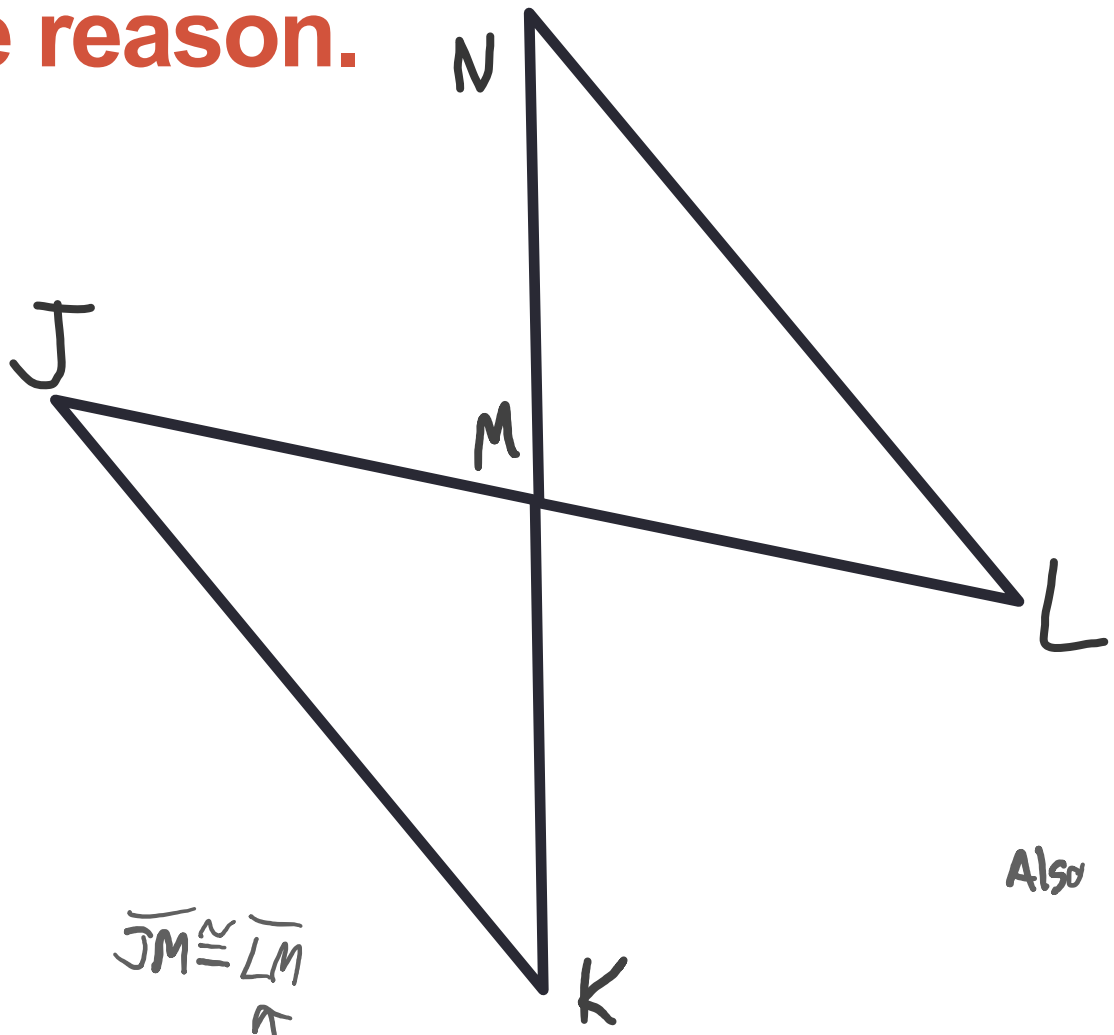


- $\angle GHF \cong \angle IHF$ (Def. of angle bisector)
- $\overline{FH} \cong \overline{FH}$ (Reflexive Property)

$\overline{FH}$ bisects angle GHI.

What can you add to the diagram?

State the reason.

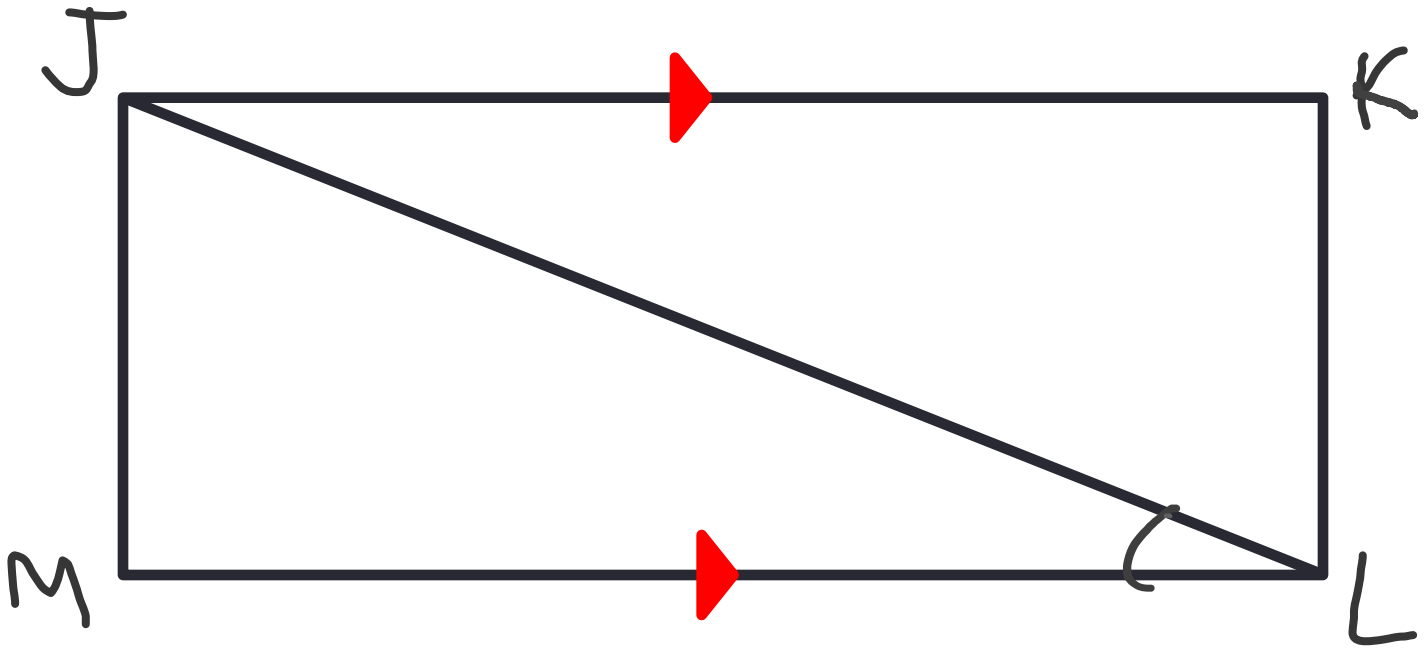


$\overline{JM} \cong \overline{LM}$

M is the midpoint of JL and NK. → $\overline{NM} \cong \overline{KM}$

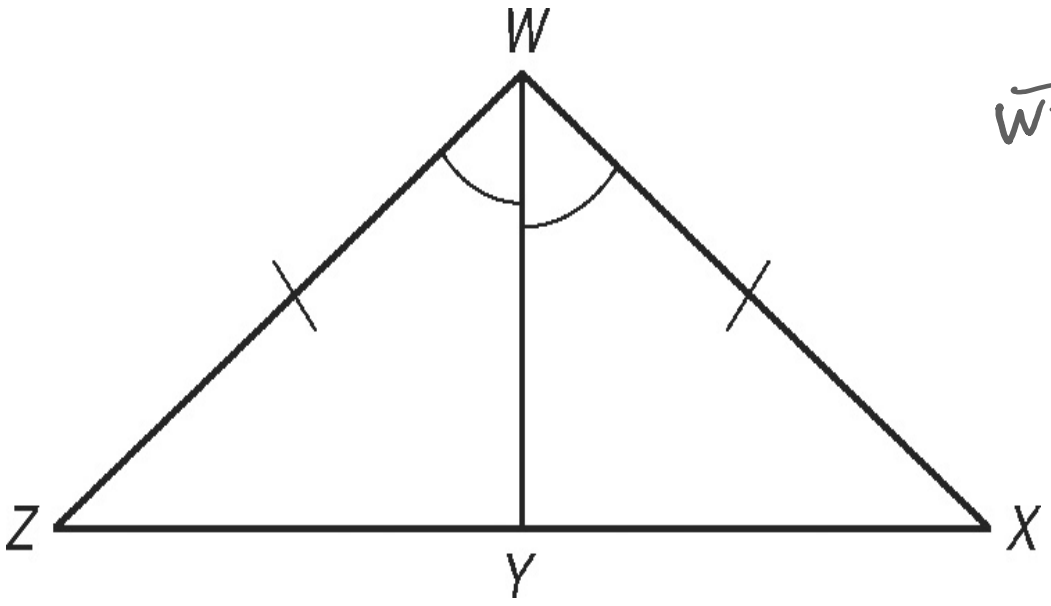
Also $\angle JMK \cong \angle LMN$ (vertical Angles)

What can you add to the diagram?
State the reason.



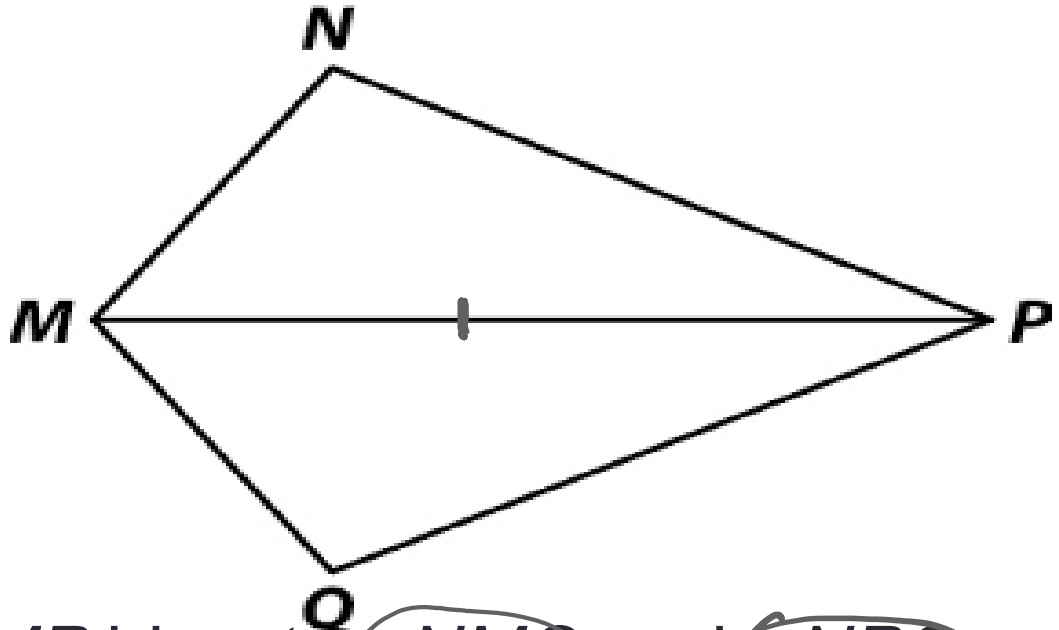
$\angle KJL \cong \angle MLJ$ (Alternate Interior)

$\overline{JL} \cong \overline{JL}$ (Reflexive)



$\overline{WY} \cong \overline{WY}$

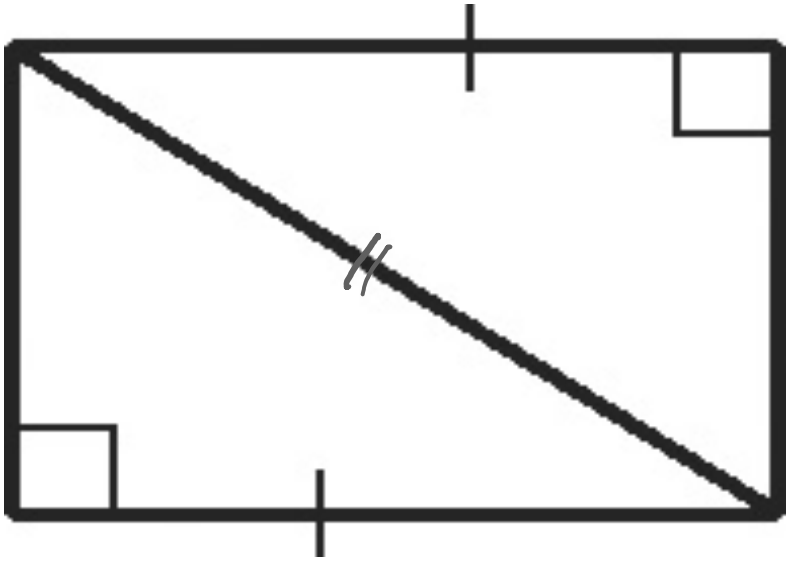
(Reflexive)



MP bisects $\angle NMQ$ and $\angle NPQ$.

$\angle NMP \cong \angle QMP$

$\angle NPM \cong \angle QPM$



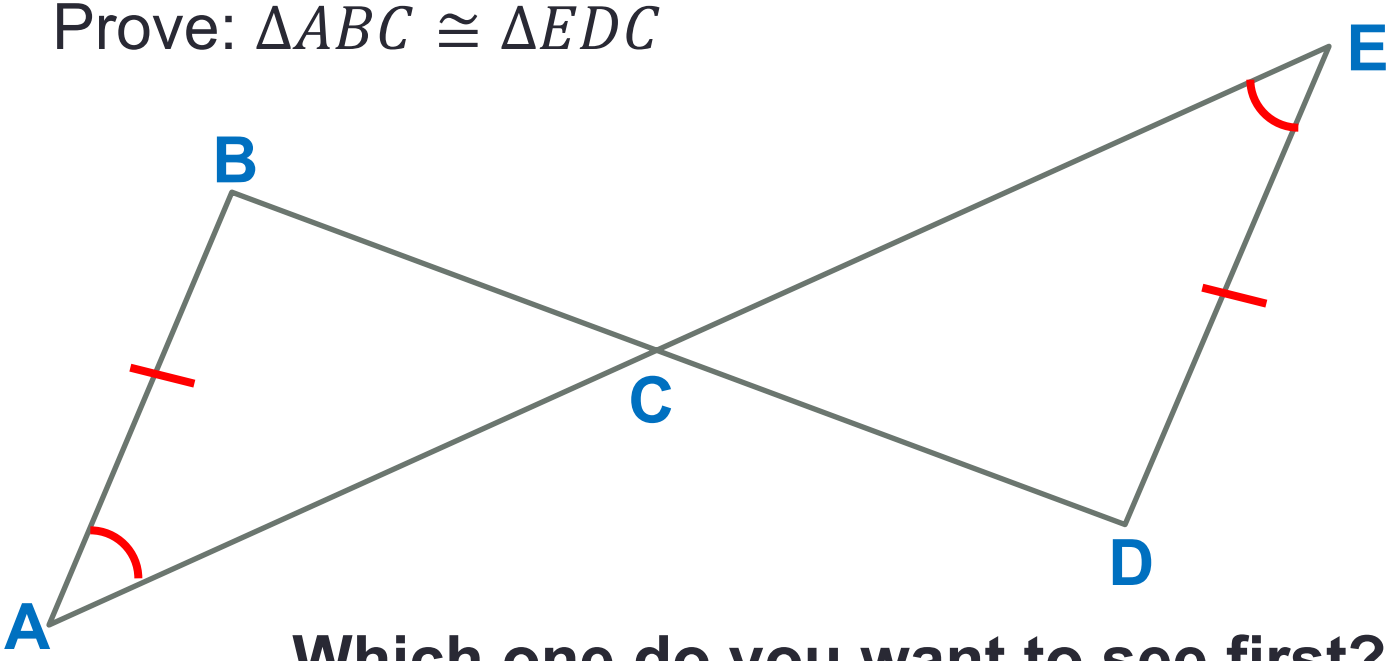
Congruent by HL

What's the difference between a proof and what we have been doing?

- In a proof, you must **justify each step**.

- You need to **state what you know**, and **why you know it.**

Prove: $\Delta ABC \cong \Delta EDC$



Which one do you want to see first?

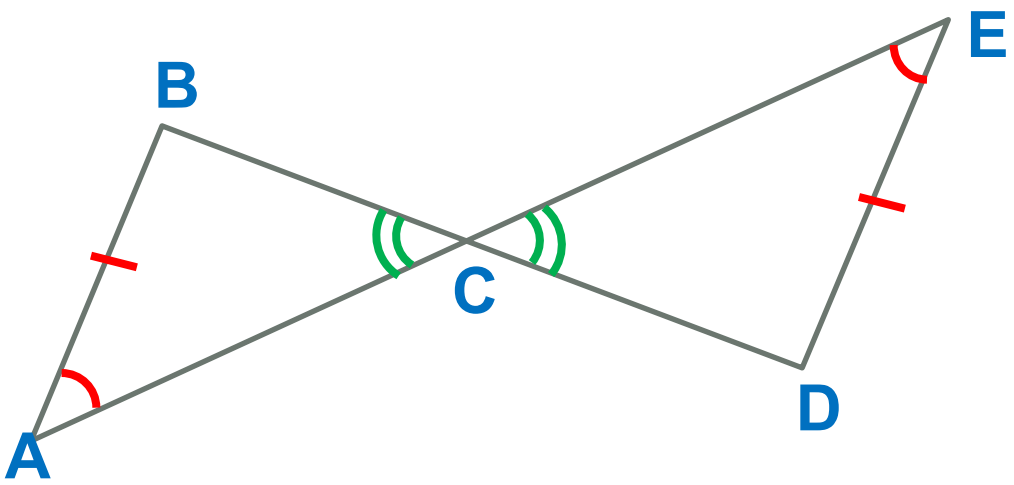
- **Paragraph proof**
- **Two-column proof**
- **Flow-chart proof**

Paragraph Proof

- Just write, using complete sentences, a logical argument that proves what you want to prove. For everything you state, you must say how you know it.

Paragraph Proof

- Prove: $\Delta ABC \cong \Delta EDC$



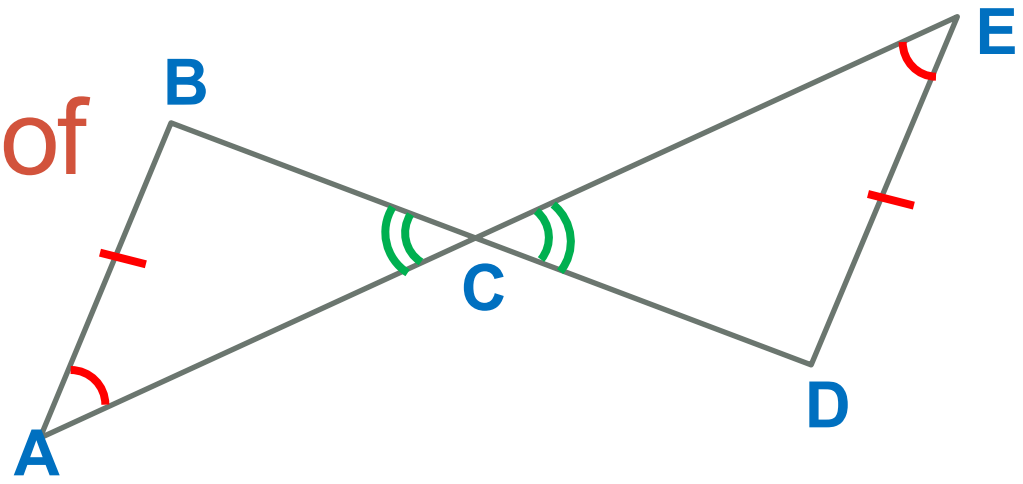
- **We know $\overline{AB} \cong \overline{ED}$ because it is given. We also know that $\angle A \cong \angle E$ because it is given. In addition, $\angle BCA \cong \angle DCE$ because they are vertical angles. Thus, $\Delta ABC \cong \Delta EDC$ by AAS.** ▫

Two-Column Proof

- Organizes your proof into columns. One column is for your statements, and the other one is for your reasons. The last statement will always be the one you are trying to prove.

Two-Column Proof

- Prove: $\Delta ABC \cong \Delta EDC$



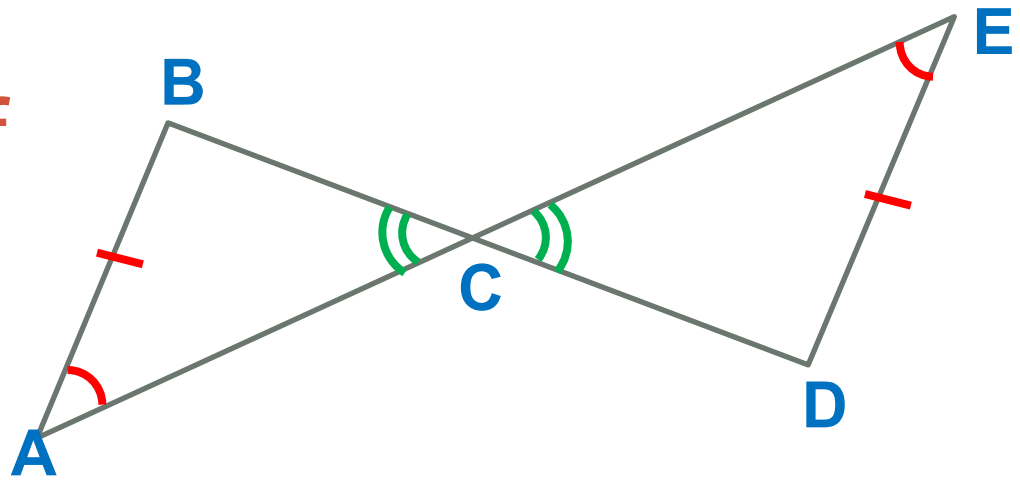
	Statement	Reason
A	1) $\angle A \cong \angle E$	1) Given
A	2) $\angle BCA \cong \angle DCE$	2) Vertical Angles Thm.
S	3) $\overline{AB} \cong \overline{ED}$	3) Given
	4) $\Delta ABC \cong \Delta EDC$	4) AAS ▫

Flow Chart Proof

- A visual depiction of your proof. Each “bubble” will have a statement and a reason in it. You draw arrows to show which statements lead to which other statements.

Flow-Chart Proof

- Prove: $\Delta ABC \cong \Delta EDC$



Given:
$\angle A \cong \angle E$

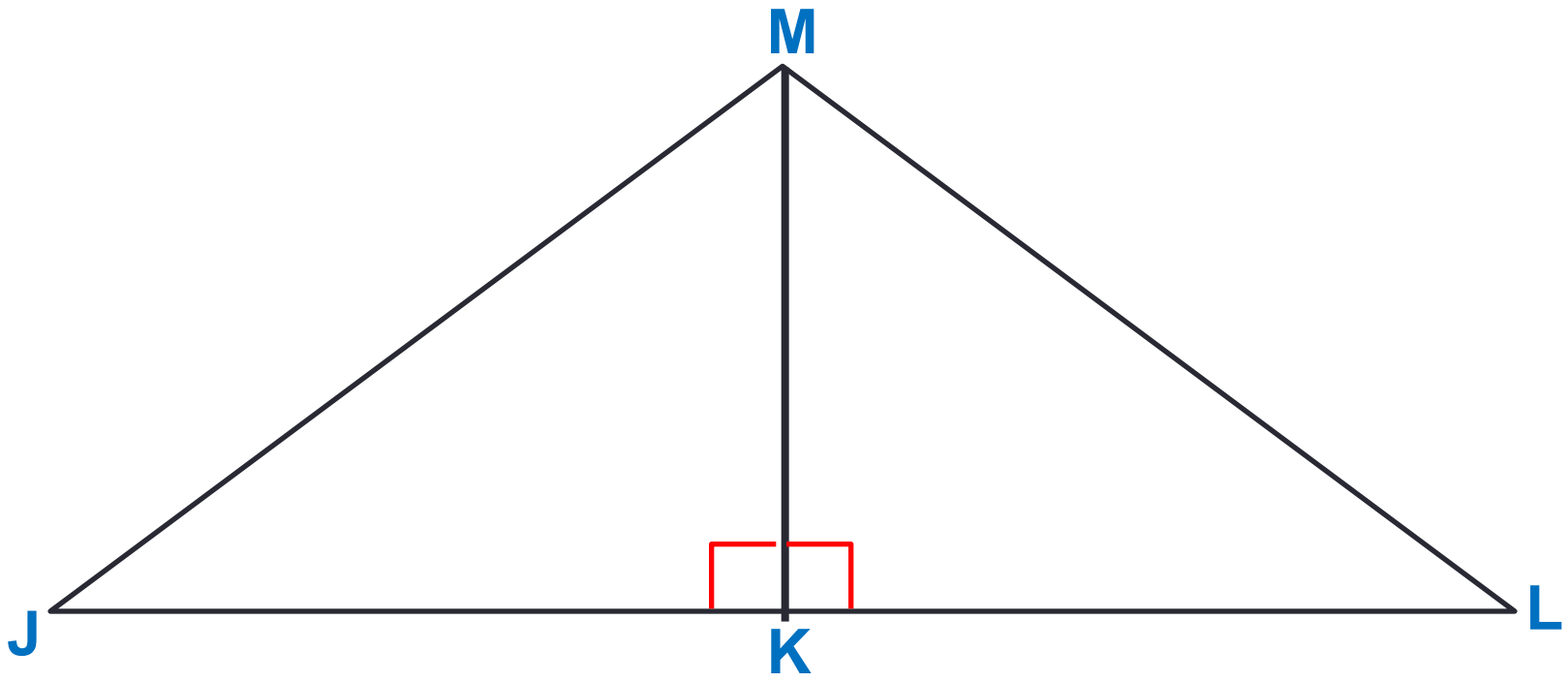
Vertical Angles Thm:
$\angle BCA \cong \angle DCE$

Given:
$\overline{AB} \cong \overline{ED}$

AAS
$\Delta ABC \cong \Delta EDC$

Given: K is the midpoint of $\overline{JL}$.

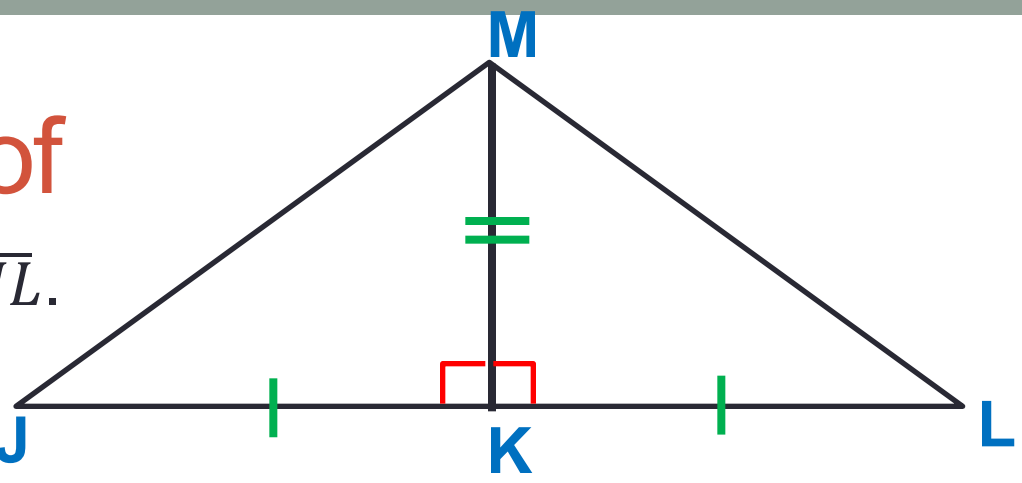
Prove: $\Delta JKM \cong \Delta LKM$



Two-Column Proof

Given: K is the midpoint of $\overline{JL}$.

Prove: $\Delta JKM \cong \Delta LKM$

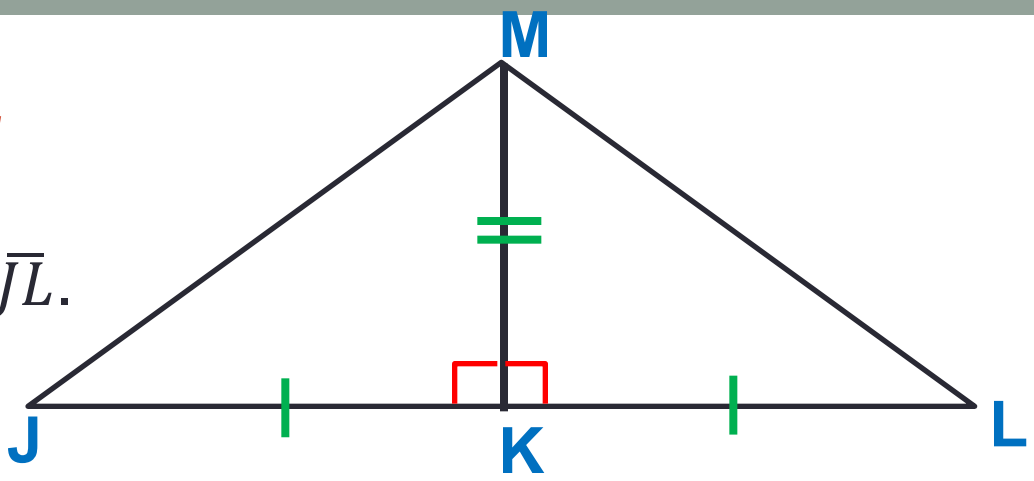


Statement	Reason
1) $\overline{MK} \cong \overline{MK}$	1) Reflexive Property
2) $\angle JKM \cong \angle LKM$	2) Given
3) K is the midpoint of $\overline{JL}$	3) Given
4) $\overline{JK} \cong \overline{LK}$	4) Definition of midpoint
5) $\Delta JKM \cong \Delta LKM$	5) SAS ▫

Flow-Chart Proof

Given: K is the midpoint of $\overline{JL}$.

Prove: $\Delta JKM \cong \Delta LKM$



Reflexive Prop.
$\overline{KM} \cong \overline{KM}$

Given:
$\angle JKM \cong \angle LKM$

Given:
K is the midpoint of $\overline{JL}$

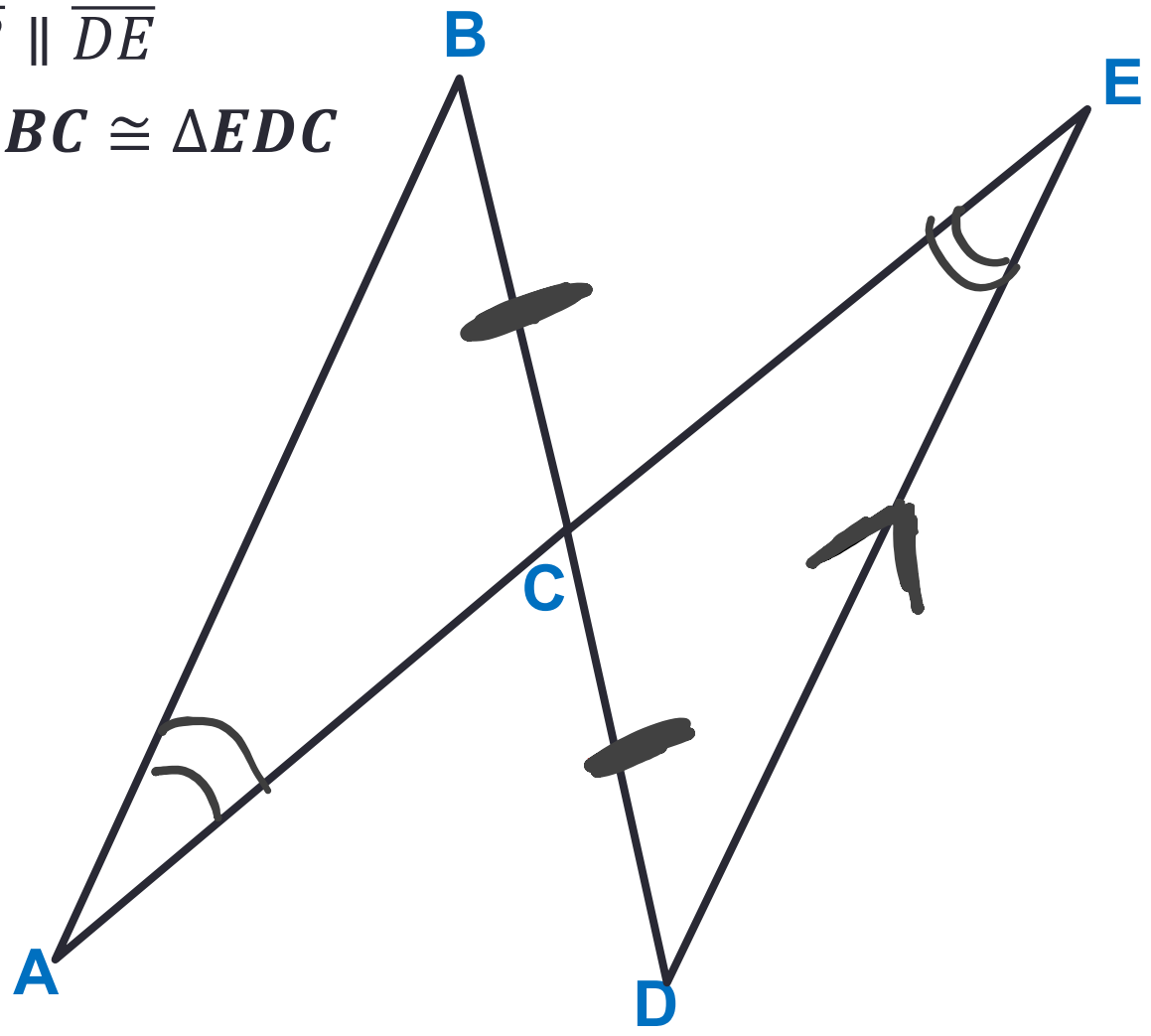
Def. of midpoint:
$\overline{JK} \cong \overline{LK}$

SAS
$\Delta JKM \cong \Delta LKM$

On your giant whiteboards, write a proof:

Given: $\overline{AB} \parallel \overline{DE}$

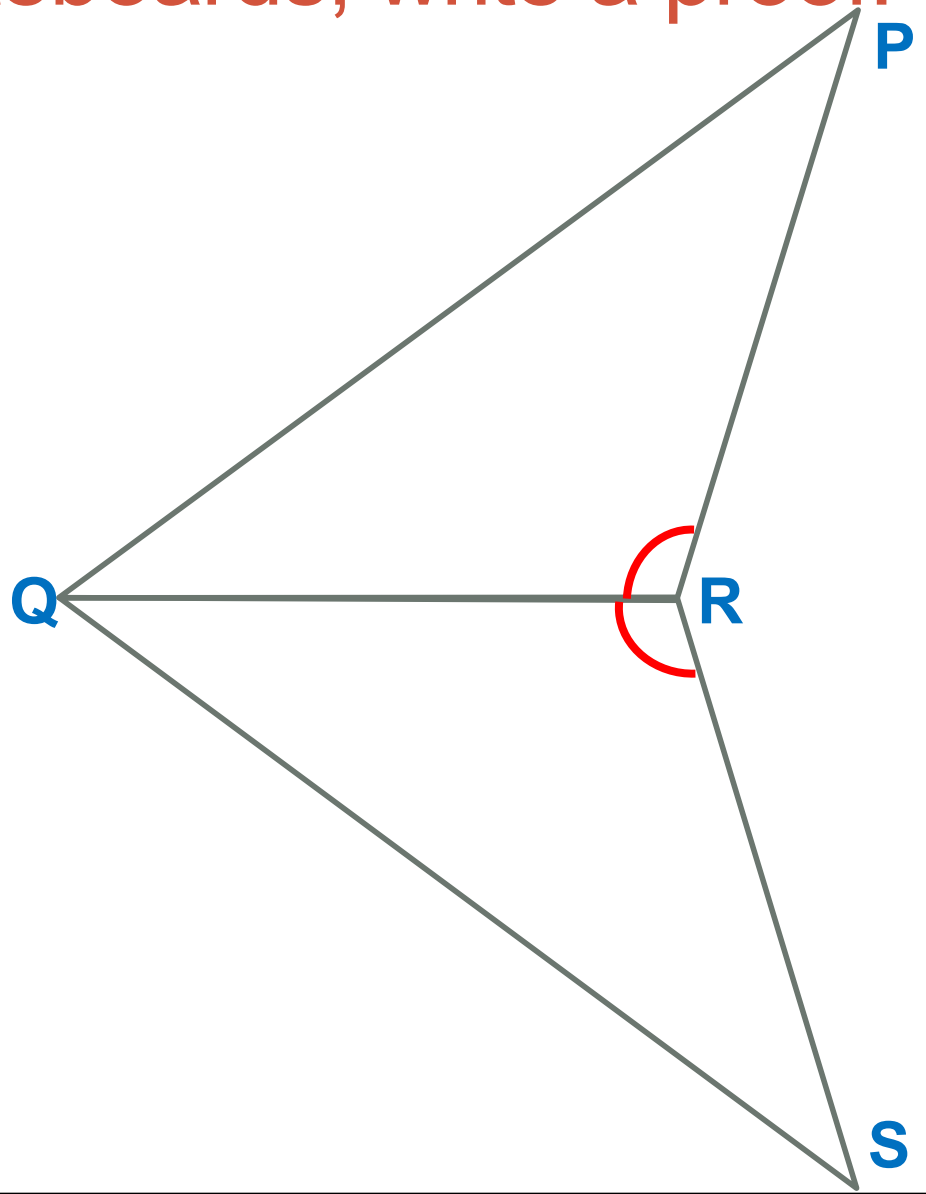
Prove: $\Delta \boldsymbol{ABC} \cong \Delta \boldsymbol{EDC}$



On your giant whiteboards, write a proof:

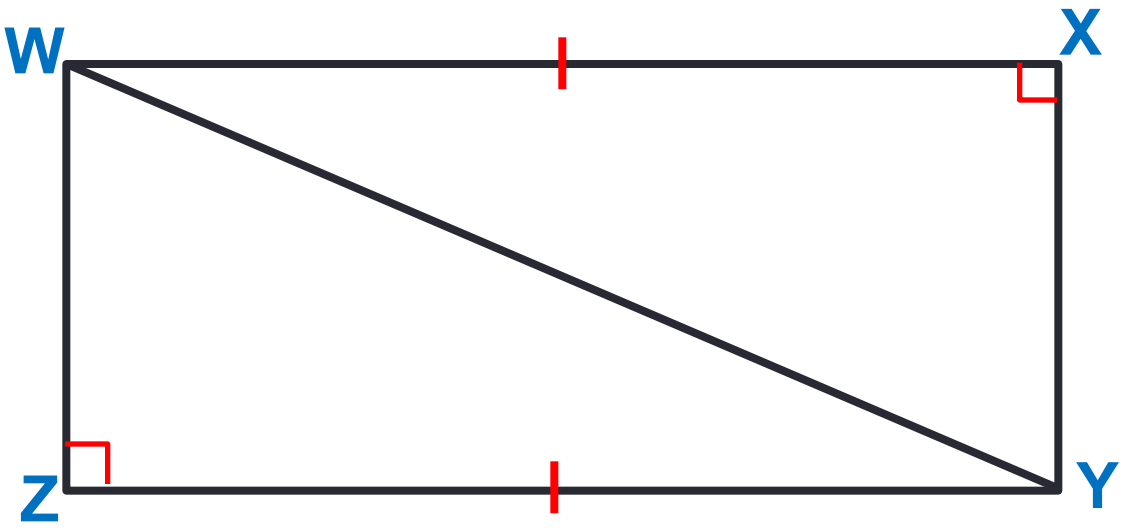
Given: $\overline{\boldsymbol{QR}}$ bisects $\angle \boldsymbol{PQS}$.

Prove: $\Delta \boldsymbol{PQR} \cong \Delta \boldsymbol{SQR}$



On your giant whiteboards, write a proof:

Prove: $\Delta WXY \cong \Delta YZW$



Homework

- Worksheet