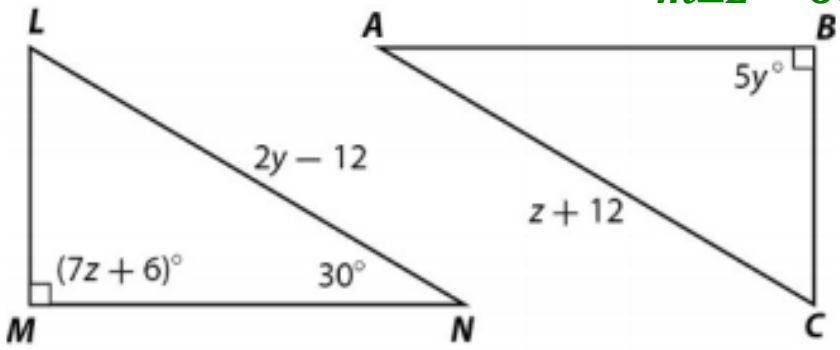
Warm Up

$\triangle LMN \cong \triangle CBA$. Find each value.

$7z + 6 = 90$
$7z = 84$
$z = 12$

$90 + 30 + m\angle L = 180$
$120 + m\angle L = 180$
$m\angle L = 60$



$5y = 90$
$y = 18$

1. $z =$ 12
2. $y =$ 18
3. $m\angle L =$ 60°
4. $LN =$ 24
5. $m\angle C =$ 60°
6. $AC =$ 24

$LN = 2(18) - 12$
$LN = 24$

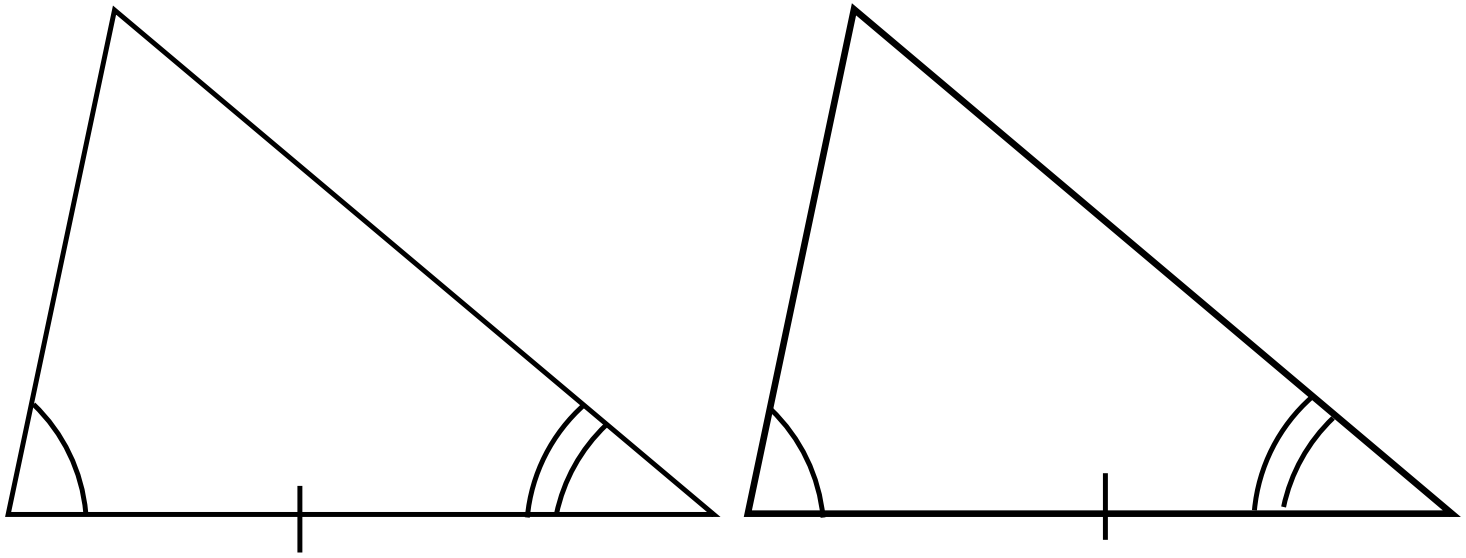
$m\angle C = m\angle L$
$m\angle C = 60$

$AC = 12 + 12$
$AC = 24$

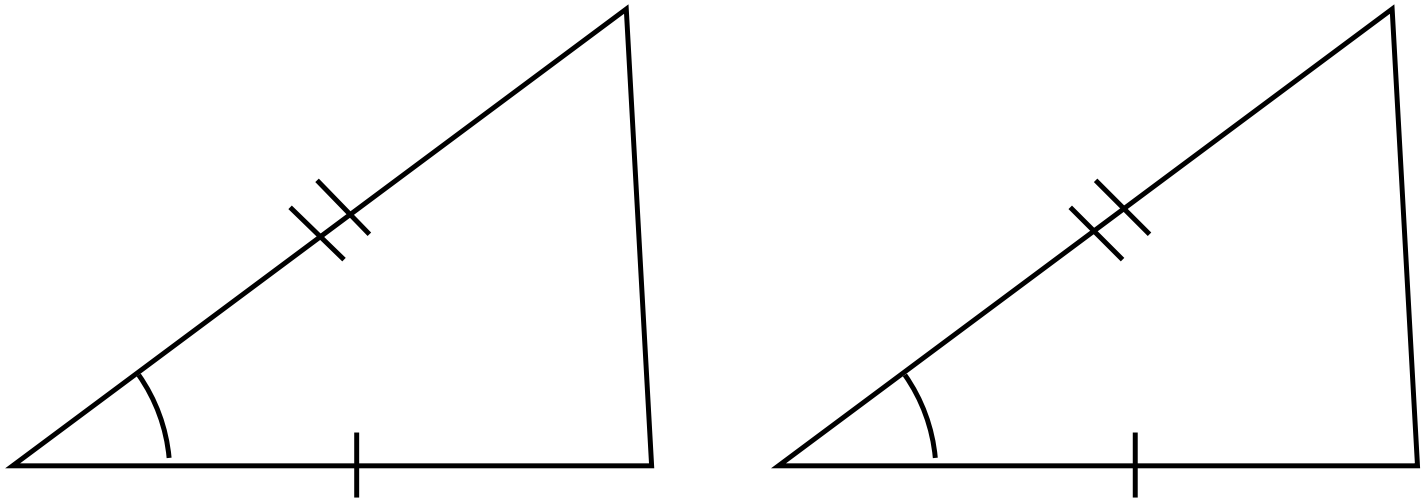
(also, $AC = LN$)

Marking Congruent Triangles

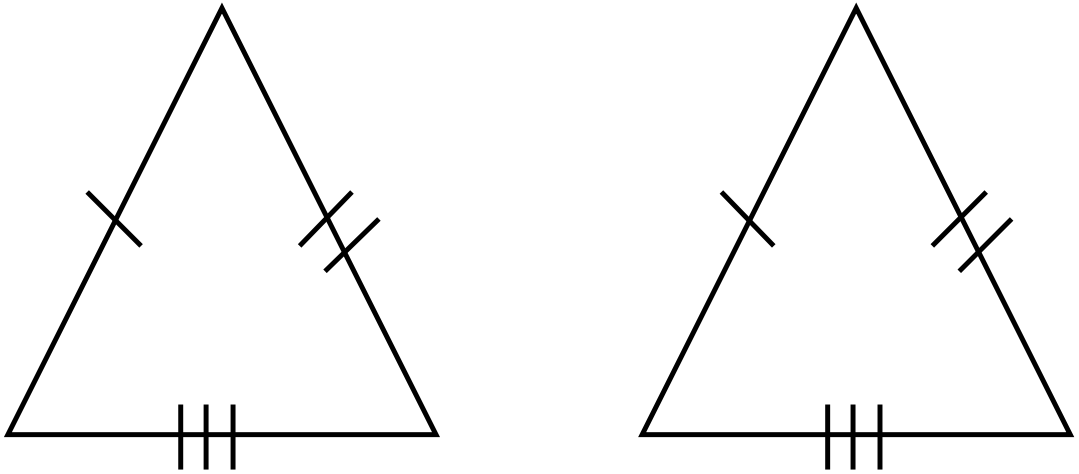
Angle-Side-Angle (ASA)



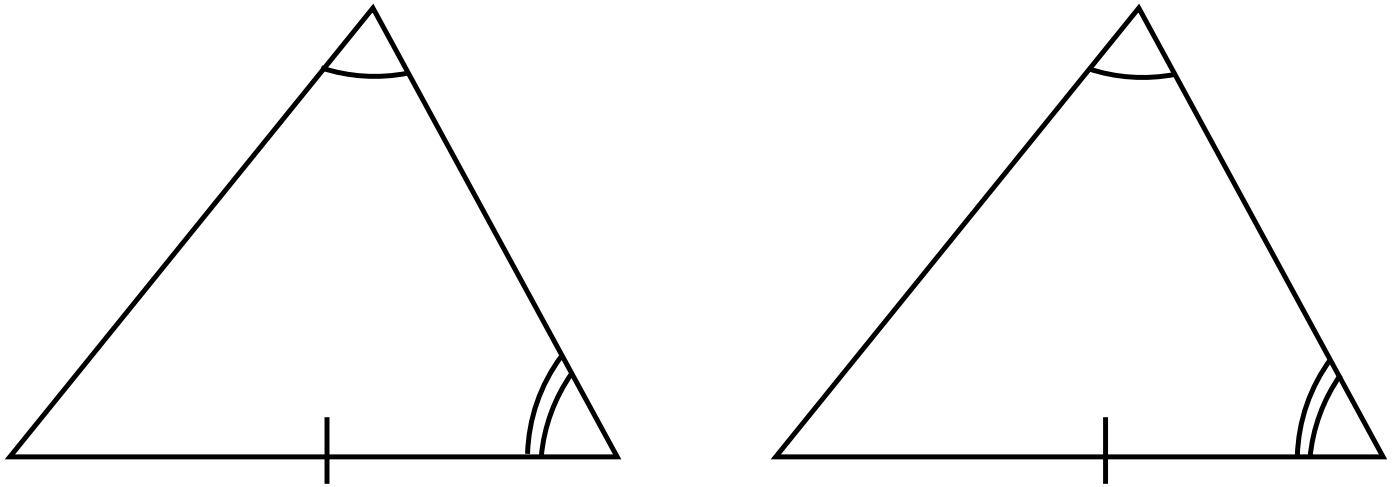
Side-Angle-Side (SAS)



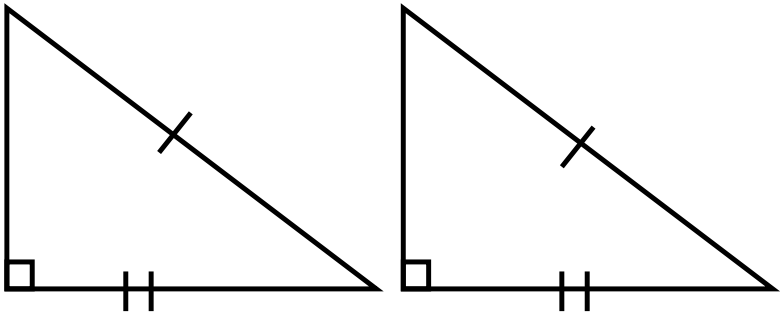
Side-Side-Side (SSS)



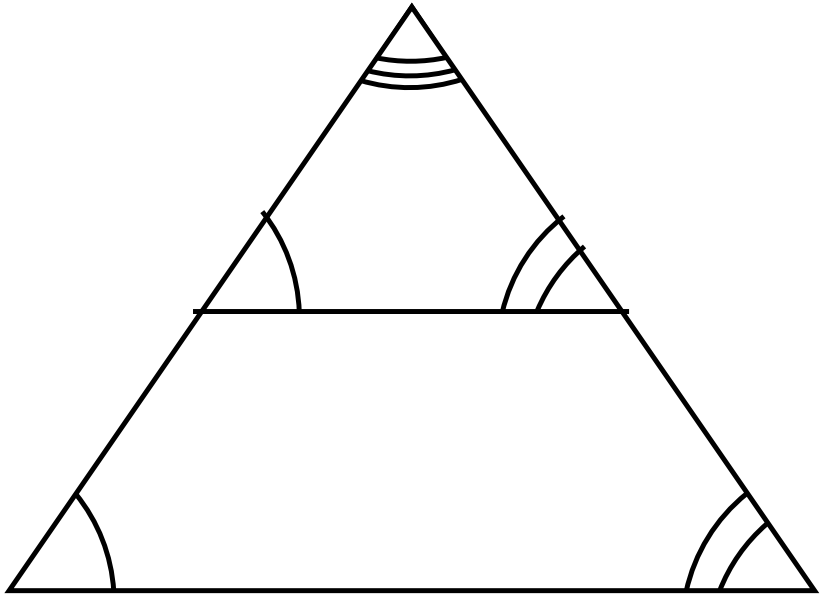
Angle-Angle-Side (AAS)



Hypotenuse-Leg (HL)

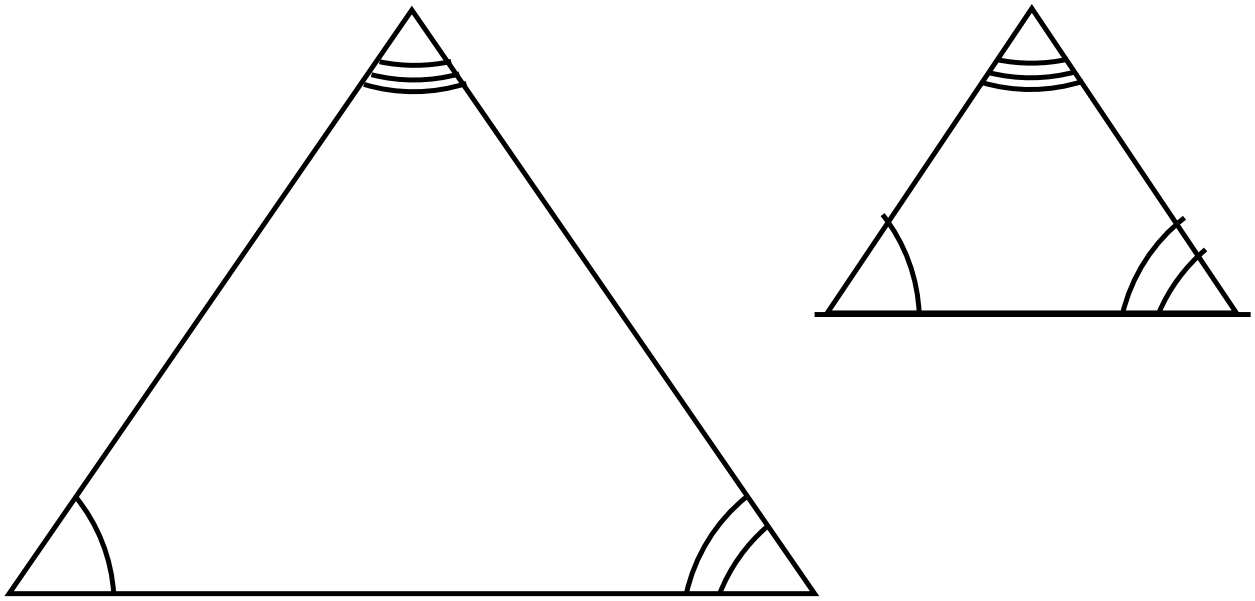


Does AAA work?

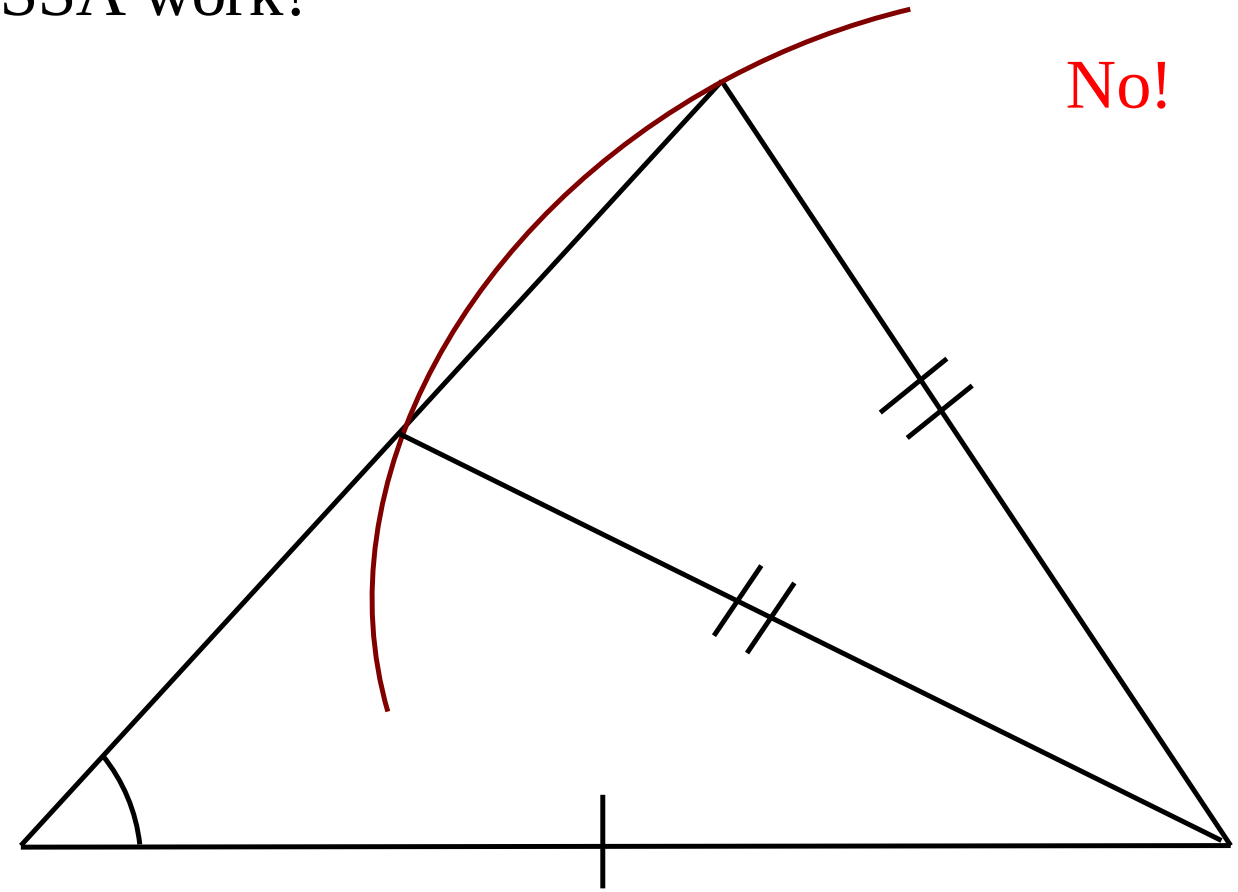


Does AAA work?

NO!



Does SSA work?



No!

There is no SSA in geometry!

Very Important

Other that the "given" information, you can only mark three things:

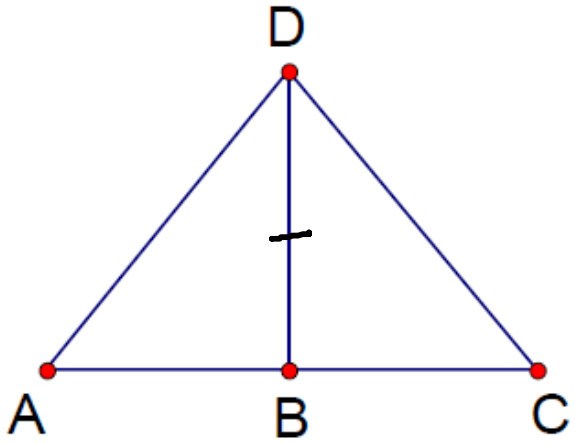
1. Shared Side (Overlapping Side)

   or a Shared Angle

2. Vertical Angles

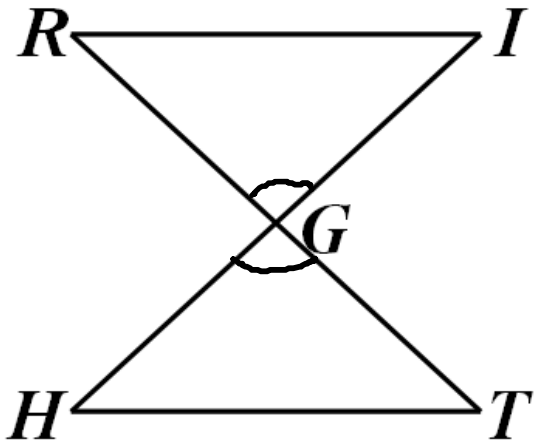
3. Alternate Interior Angles (only if lines parallel).

Shared Side



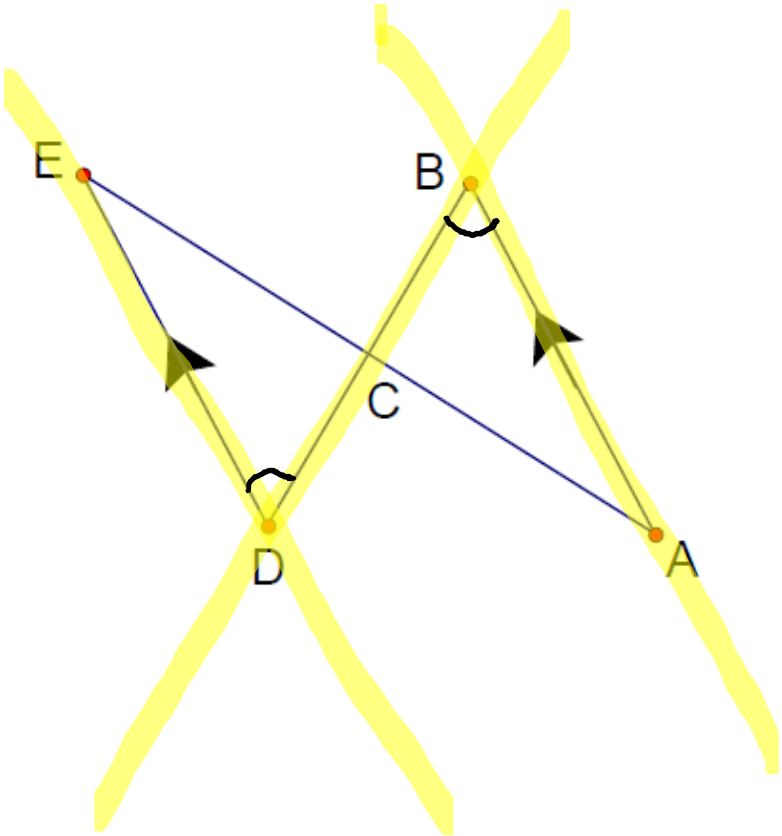
statement	reason
$\overline{DB} \cong \overline{DB}$	Reflex.

Vertical Angles



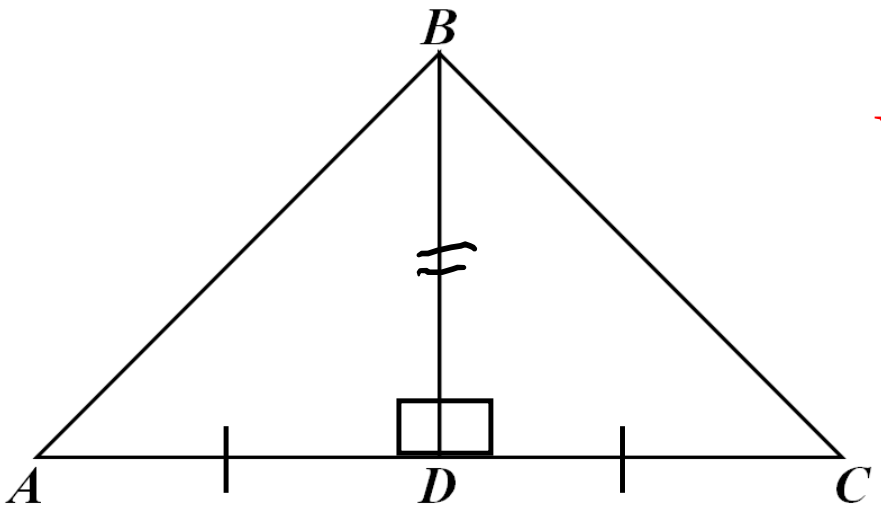
statement	reason
$\angle RGI \cong \angle HGT$	vert. $\angle$'s

Alternate Interior Angles (only if lines parallel)



statement	reason
$\angle B \cong \angle D$	Alt. Int. $\angle$'s

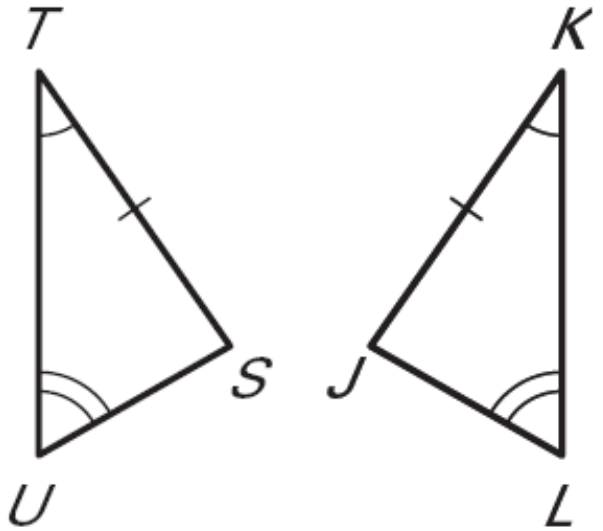
Decide whether the triangles are congruent. Explain your reasoning.



Yes, SAS

SSS
SAS
ASA
AAS
HL

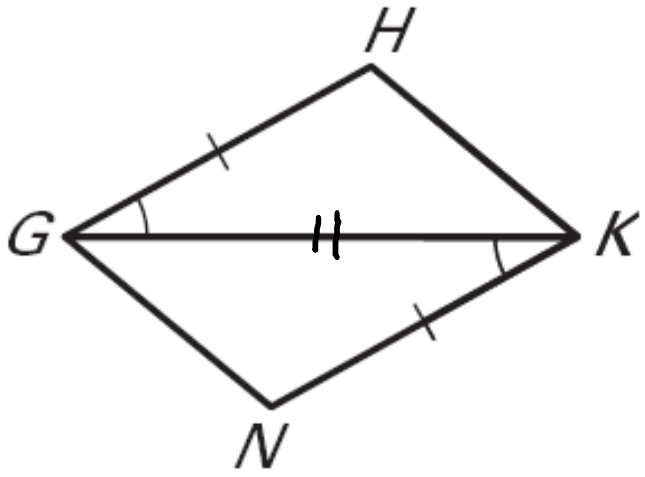
Decide whether the triangles are congruent. Explain your reasoning.



Yes, AAS

SSS
SAS
ASA
AAS
~~HL~~

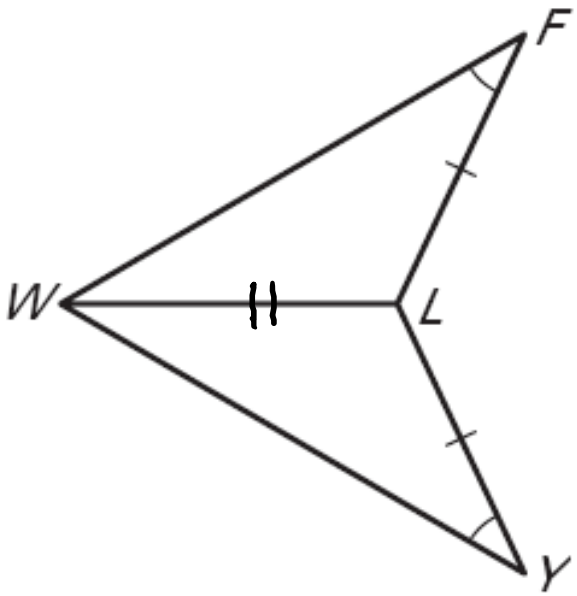
Decide whether the triangles are congruent. Explain your reasoning.



Yes, SAS

SSS
SAS
ASA
AAS
HL

Decide whether the triangles are congruent. Explain your reasoning.



No, SSA doesn't work!

SSS

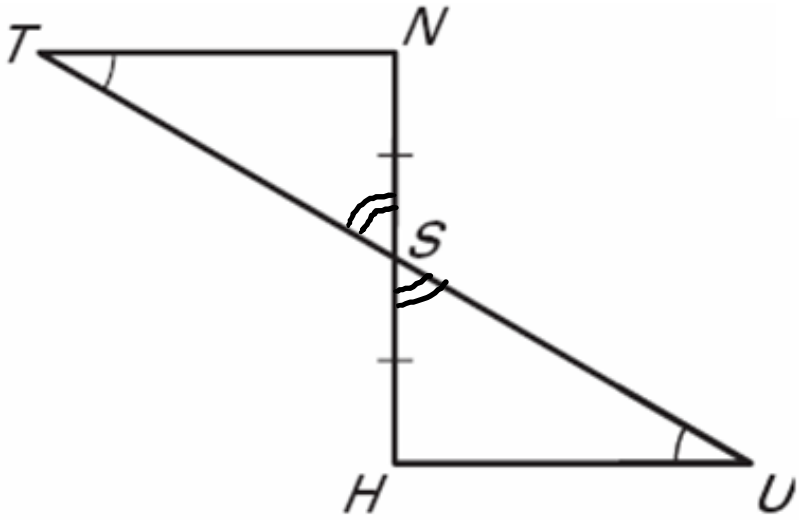
SAS }

~~ASA~~

AAS

HL

Decide whether the triangles are congruent. Explain your reasoning.

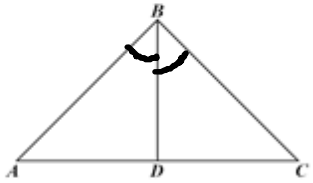


Yes, AAS

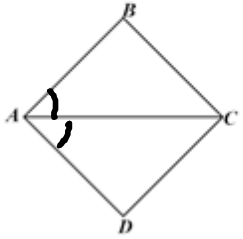
SSS
SAS
ASA
AAS
~~HL~~

How to Mark:

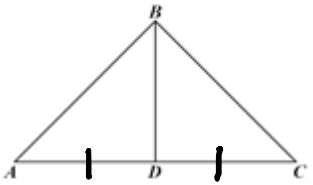
- **Angle Bisectors**: "$\overline{BD}$ bisects $\angle ABC$"



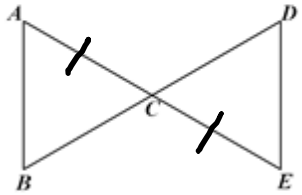
"$\overline{AC}$ bisects $\angle BAD$"



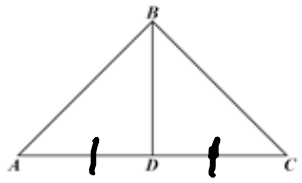
- **Segment Bisectors**: "$\overline{BD}$ bisects $\overline{AC}$ "

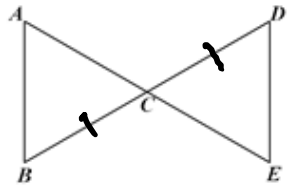


"$\overline{BD}$ bisects $\overline{AE}$" or "C bisects $\overline{AE}$"

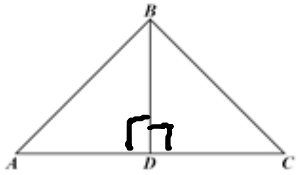


- **Midpoints:** "D is midpoint of $\overline{AC}$" "C is midpoint of $\overline{BD}$"

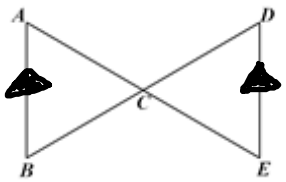




- **Perpendicular Lines:** "$\overline{BD} \perp \overline{AC}$"

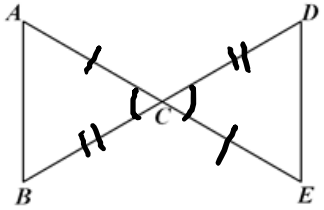


- **Parallel Lines:** "$\overline{AB} \parallel \overline{ED}$"



***Remember: Parallel does NOT mean Congruent, but you can get congruent** alt. int. ∠'s

1. C bisects $\overline{AE}$ and $\overline{BD}$

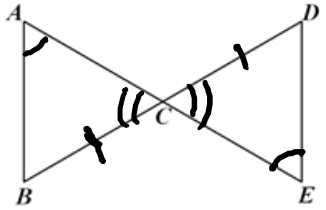


$\Delta ABC \cong \Delta$ EDC

by SAS

SSS
SAS
ASA
AAS
~~HL~~

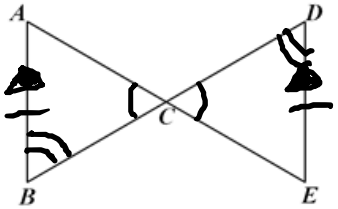
2. $\angle A \cong \angle E$, $\overline{BC} \cong \overline{DC}$



$\Delta ABC \cong \Delta$ EDC

by A AS

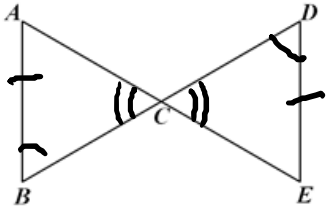
3. $\overline{AB} \parallel \overline{ED}$, $\overline{AB} \cong \overline{ED}$



$\Delta BCA \cong \Delta$ DCE

by A AS

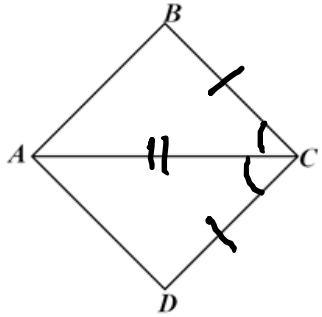
4. $\angle B \cong \angle D$, $\overline{AB} \cong \overline{ED}$



$\Delta CAB \cong \Delta$ CED

by A AS

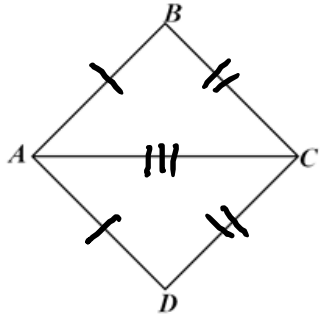
5. $\overline{AC}$ bisects $\angle BCD$, $\overline{BC} \cong \overline{DC}$



$\Delta ACB \cong \Delta$ ACD

by SAS

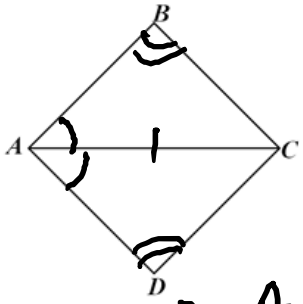
6. $\overline{AB} \cong \overline{AD}$, $\overline{BC} \cong \overline{DC}$



$\Delta CAB \cong \Delta$ CAD

by SSS

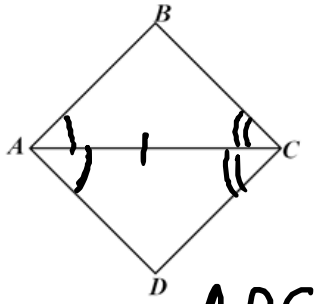
7. $\angle BAC \cong \angle DAC$, $\angle B \cong \angle D$



$\Delta BCA \cong \Delta$ DCA

by A AS

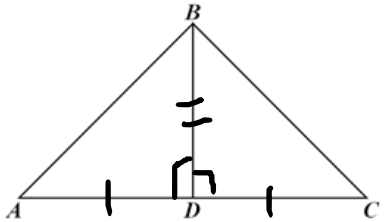
8. $\overline{AC}$ bisects $\angle BAD$ and $\angle BCD$



$\Delta ABC \cong \Delta$ ADC

by ASA

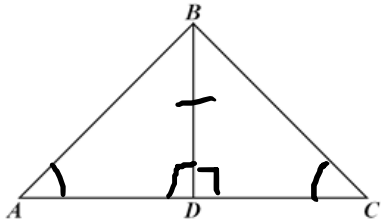
9. $\overline{BD} \perp \overline{AC}$, D is midpoint of $\overline{AC}$



$\Delta BAD \cong \Delta$ BCD

by SAS

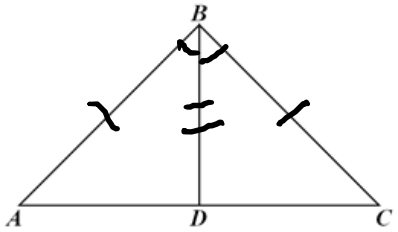
10. $\overline{BD} \perp \overline{AC}$, $\angle A \cong \angle C$



$\Delta BAD \cong \Delta$ BCD

by AAS

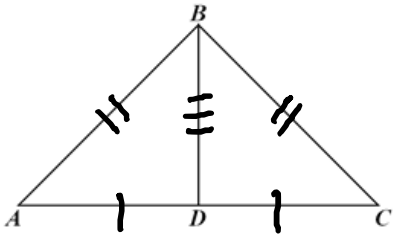
11. $\overline{BD}$ bisects $\angle ABC$, $\overline{BA} \cong \overline{BC}$



$\Delta ADB \cong \Delta$ CDB

by SAS

12. $\overline{BD}$ bisects $\overline{AC}$, $\overline{BA} \cong \overline{BC}$



$\Delta ADB \cong \Delta$ CDB

by SSS