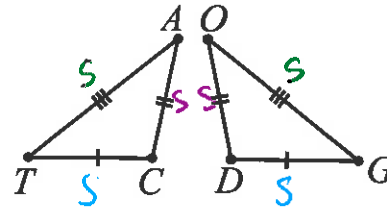


Proving Triangles Congruent

There are only 5 ways to prove two triangles are congruent!

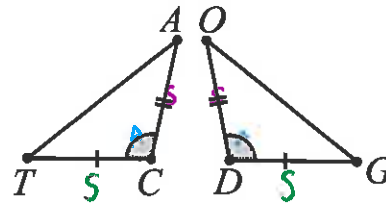
1. SSS: Side-Side-Side

$$\left. \begin{array}{l} \text{Side } \overline{CT} \cong \overline{GD} \\ \text{Side } \overline{AC} \cong \overline{OD} \\ \text{Side } \overline{AT} \cong \overline{OG} \end{array} \right\} \Delta CAT \cong \Delta DOG \text{ By SSS}$$



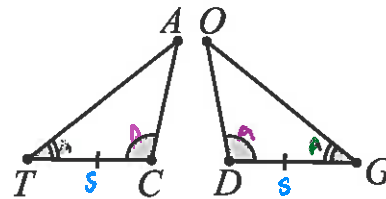
2. SAS: Side-Angle-Side

$$\left. \begin{array}{l} \text{Side } \overline{TC} \cong \overline{GD} \\ \text{Angle } \angle C \cong \angle D \\ \text{Side } \overline{AC} \cong \overline{OD} \end{array} \right\} \Delta CAT \cong \Delta DOG \text{ By SAS}$$



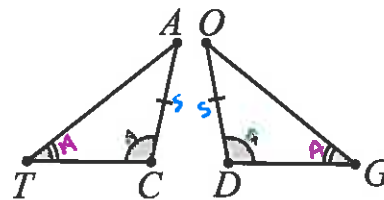
3. ASA: Angle-Side-Angle

$$\left. \begin{array}{l} \text{Angle } \angle T \cong \angle G \\ \text{Side } \overline{TC} \cong \overline{GD} \\ \text{Angle } \angle C \cong \angle D \end{array} \right\} \Delta CAT \cong \Delta DOG \text{ By ASA}$$



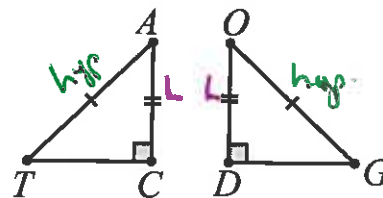
4. AAS: Angle-Angle-Side

$$\left. \begin{array}{l} \text{Angle } \angle T \cong \angle G \\ \text{Angle } \angle C \cong \angle D \\ \text{Side } \overline{AC} \cong \overline{OD} \end{array} \right\} \Delta CAT \cong \Delta DOG \text{ By AAS}$$



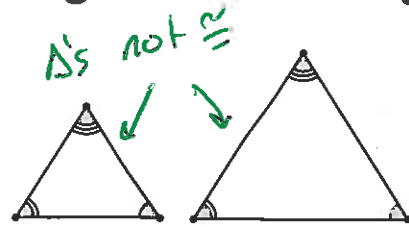
5. HL: Hypotenuse-Leg (Rt Δ's)

$$\left. \begin{array}{l} \text{Hyp. } \overline{AT} \cong \overline{OG} \\ \text{Leg } \overline{AC} \cong \overline{OD} \end{array} \right\} \Delta CAT \cong \Delta DOG \text{ By HL}$$

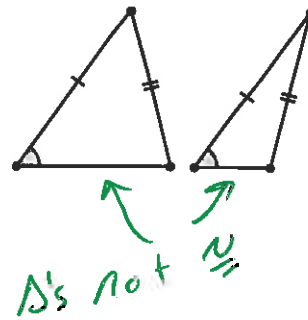


Methods that **DO NOT** prove Triangles to be Congruent

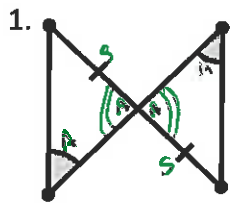
1. AAA: Angle-Angle-Angle



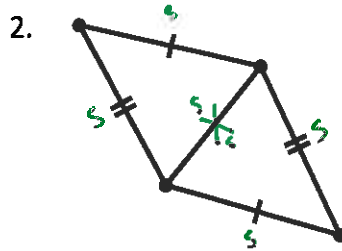
2. ASS or SSA: Angle-Side-Side



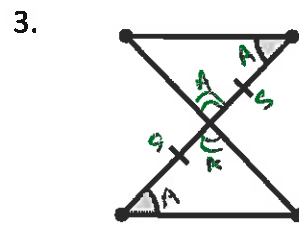
Examples: Which triangle postulate shows that the triangles are congruent?



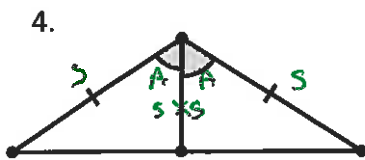
AAS



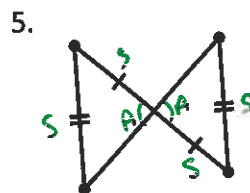
SSS



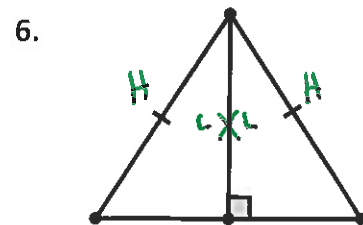
ASA



SAS



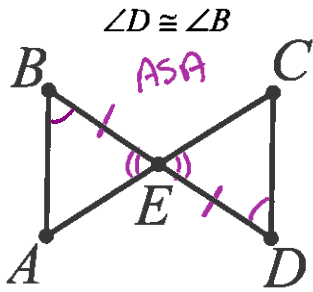
Δ's not ≅
(ASS)



H-L

Examples:

1. Given: E midpoint of \overline{BD}



$\angle D \cong \angle B$

- Congruent Parts
- A $\angle B \cong \angle D$
 - S $\overline{BE} \cong \overline{DE}$
 - A $\angle BEA \cong \angle DEC$

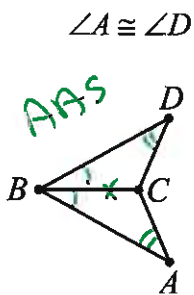
Name the Congruent Triangles: $\triangle BEA \cong \triangle DEC$

Reason

Given
 midpt makes 2 \cong segs.
 vert. \angle 's are \cong .

ASA

2. Given: \overline{BC} bisects $\angle ABD$



$\angle A \cong \angle D$

- Congruent Parts
- A $\angle A \cong \angle D$
 - A $\angle CBD \cong \angle CBA$
 - S $\overline{BC} \cong \overline{BC}$

Name the Congruent Triangles: $\triangle CBD \cong \triangle CBA$

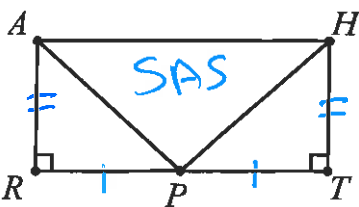
Reason

Given
 \angle bisector \div \angle into 2 \cong \angle 's.
 Reflexive.

AAS

3. Given: P midpoint of \overline{RT}

$\angle R$ & $\angle T$ right angles
 $\overline{AR} \cong \overline{HT}$



- Congruent Parts
- S $\overline{AR} \cong \overline{HT}$
 - A $\angle R \cong \angle T$
 - S $\overline{RP} \cong \overline{TP}$

Name the Congruent Triangles: $\triangle ARP \cong \triangle HTP$

Reason

Given
 rt \angle 's are \cong
 midpt make 2 \cong segs.

SAS