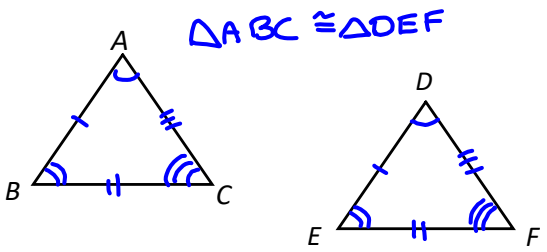
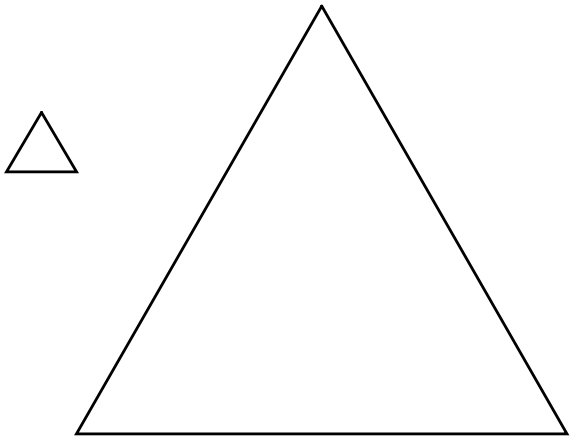
Congruent Figures

Two polygons are CONGRUENT if all pairs of corresponding parts are congruent.




$\Delta ABC \cong \Delta DEF$



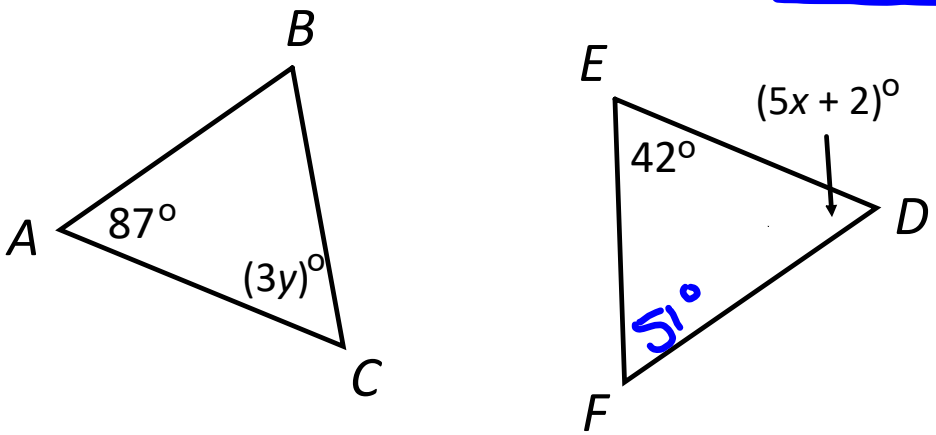
Given: $\Delta ABC \cong \Delta DEF$

Find $x$ and $y$

$5x+2=87°$

$5x=85$

$\boxed{x=17}$




$3y=51°$

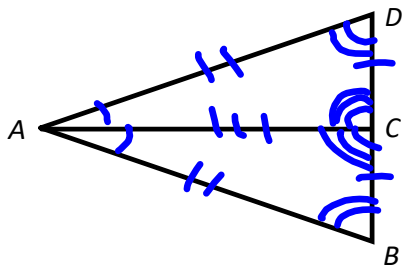
$\boxed{y=17}$

Given: $\overline{AC}$ bisects $\angle DAB$

$C$ is the midpoint of $\overline{DB}$

$\angle D \cong \angle B$, $\overline{AD} \cong \overline{AB}$

Prove: $\triangle ADC \cong \triangle ABC$

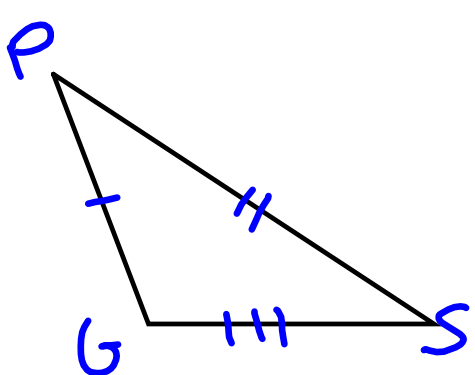


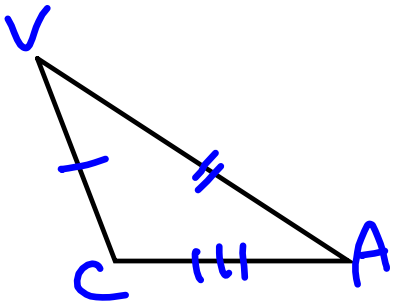

| Statements | Reasons |
|---|---|
| 1. $\overline{AC}$ bisects $\angle DAB$, $C$ is the midpoint of $\overline{DB}$, $\angle D \cong \angle B$, $\overline{AD} \cong \overline{AB}$ | 1. Given |
| 2. $\angle DAC \cong \angle BAC$ | 2. Def. of bisector |
| 3. $\overline{DC} \cong \overline{BC}$ | 3. Def. of midpoint |
| 4. $\overline{AC} \cong \overline{AC}$ | 4. Reflexive Prop. of $\cong$ |
| 5. $\angle DCA \cong \angle BCA$ | 5. 3rd $\angle$s theo. |
| 6. $\triangle ADC \cong \triangle ABC$ | 6. Definition of $\cong$. |

## 5 Postulates to Prove Triangles Congruent

Side-Side-Side (SSS) Congruency Postulate:

If three sides of one triangle are congruent to the three corresponding sides of another triangle, then the two triangles are congruent.

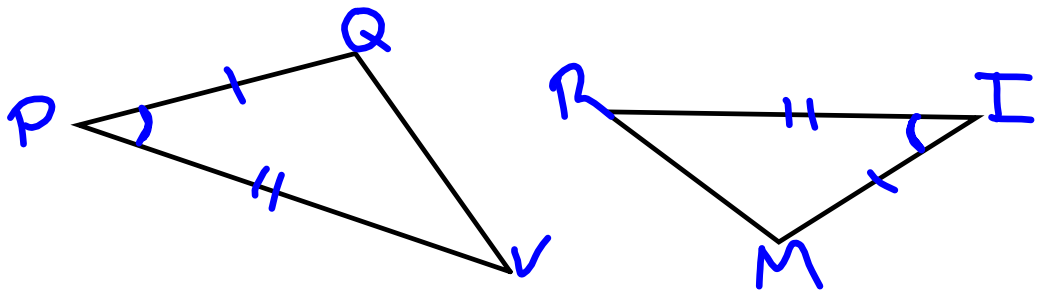



$\triangle GPS \cong \triangle CVA$ by SSS

Side-Angle-Side (SAS) Congruency Postulate:

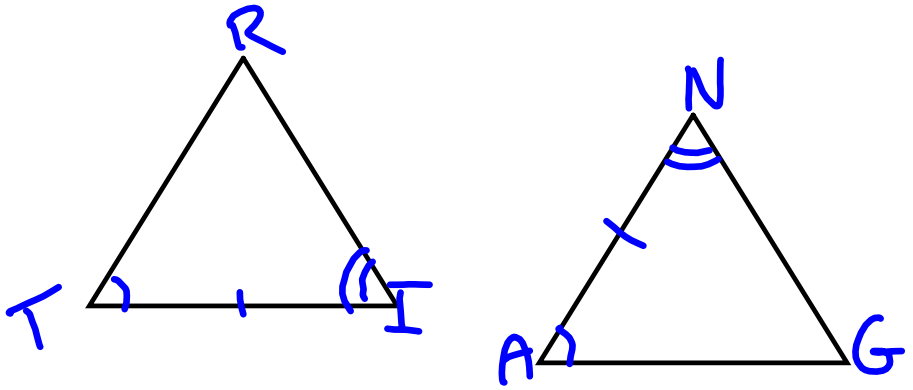
If two sides and the included angle of one triangle are congruent to the two corresponding sides and included angle of another triangle, then the two triangles are congruent.




$\triangle PQV \cong \triangle IMR$ by SAS

Angle-Side-Angle (ASA) Congruency Postulate:

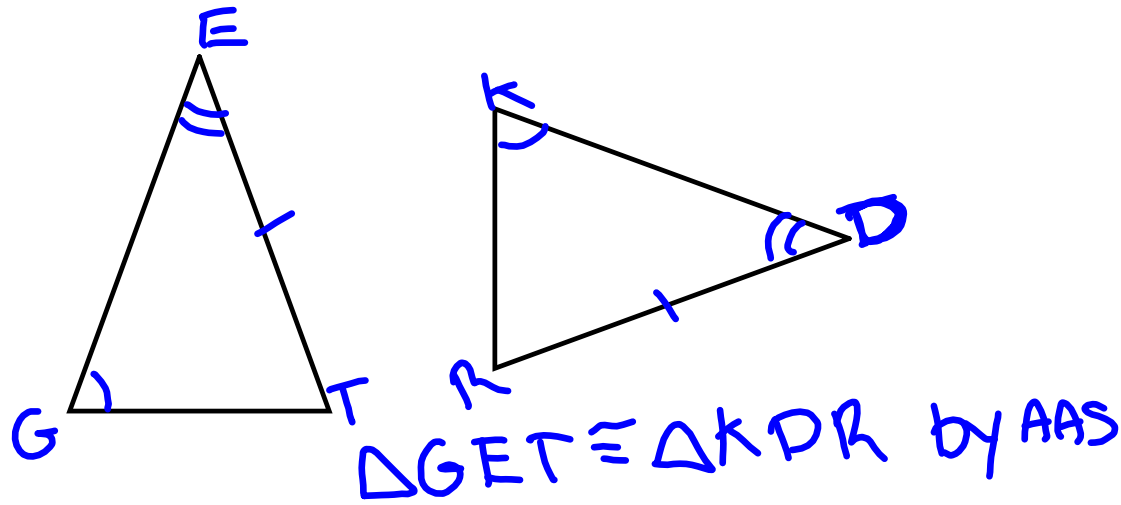
If two angles and the included side of one triangle are congruent to the two corresponding angles and included side of another triangle, then the two triangles are congruent.




$\triangle TRI \cong \triangle AGN$ by ASA

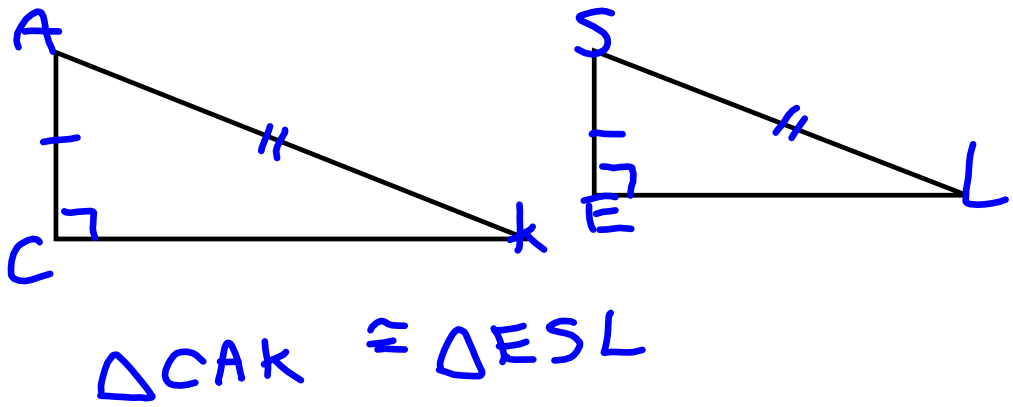
Angle-Angle-Side (AAS) Congruency Postulate:

If two angles and a non-included side of one triangle are congruent to the two corresponding angles and non-included side of another triangle, then the two triangles are congruent.



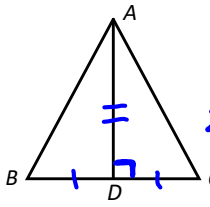

Hypotenuse-Leg (HL) Congruency Postulate:

If the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and leg of another right triangle, then the two triangles are congruent.



Given: $\overline{AD}$ is a perpendicular bisector of $\overline{BC}$

Prove the PBT




| Statements | Reasons |
|---|---|
| 1. $\overline{AD}$ is $\perp$ bis of $\overline{BC}$ | 1. Given |
| 2. $\overline{BD} \cong \overline{DC}$ | 2. Def. of bis |
| 3. $m\angle CDA = 90°$, $m\angle BDA = 90°$ | 3. Def of $\perp$ |
| 4. $m\angle CDA = m\angle BDA$ | 4. Transitive Prop. |
| 5. $\angle CDA \cong \angle BDA$ | 5. Def. of $\cong$. |
| 6. $\overline{AD} \cong \overline{AD}$ | 6. Reflexive Prop. |
| 7. $\triangle BAD \cong \triangle CAD$ | 7. SAS |
| 8. $\overline{AB} \cong \overline{AC}$ | 8. CPCTC |

Corresponding Parts of Congruent Triangles are Congruent