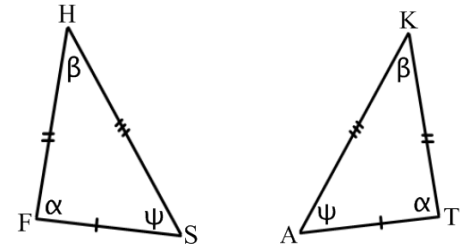


Congruent Triangles

In geometry, figures that are exact duplicates of each other are called **congruent** figures. In congruent figures, **corresponding angles** are equal and **corresponding sides** are equal. The symbol \cong is used for congruency.

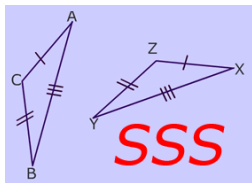
Consider the triangles shown. They are equal in all respects. That is, their corresponding sides and angles are equal:

Therefore, we say that Δ _____ \cong Δ _____



CONGRUENCE POSTULATES

There are 5 basic congruence postulates that prove congruency of triangles:

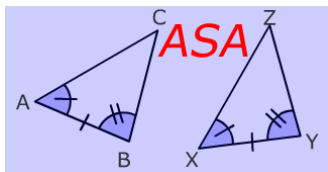
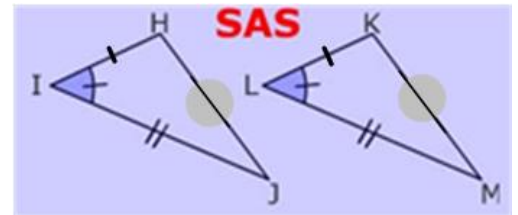


- Side-Side-Side (SSS)

If the three sides of one triangle are equal to the three sides of a second triangle, then the triangles are congruent.

- Side-Angle-Side (SAS)

If two sides and the *included* angle of one triangle are equal to two sides and the *included* angle of a second triangle, then the triangles are congruent.

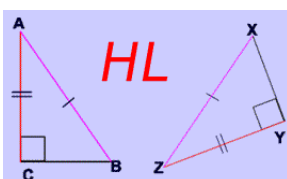
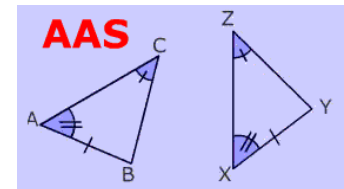


- Angle-Side-Angle (ASA)

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

- Angle-Angle-Side (AAS)

If two angles and a *non-included* side of one triangle are equal to two angles and the same *non-included* side of a second triangle, then the triangles are congruent.

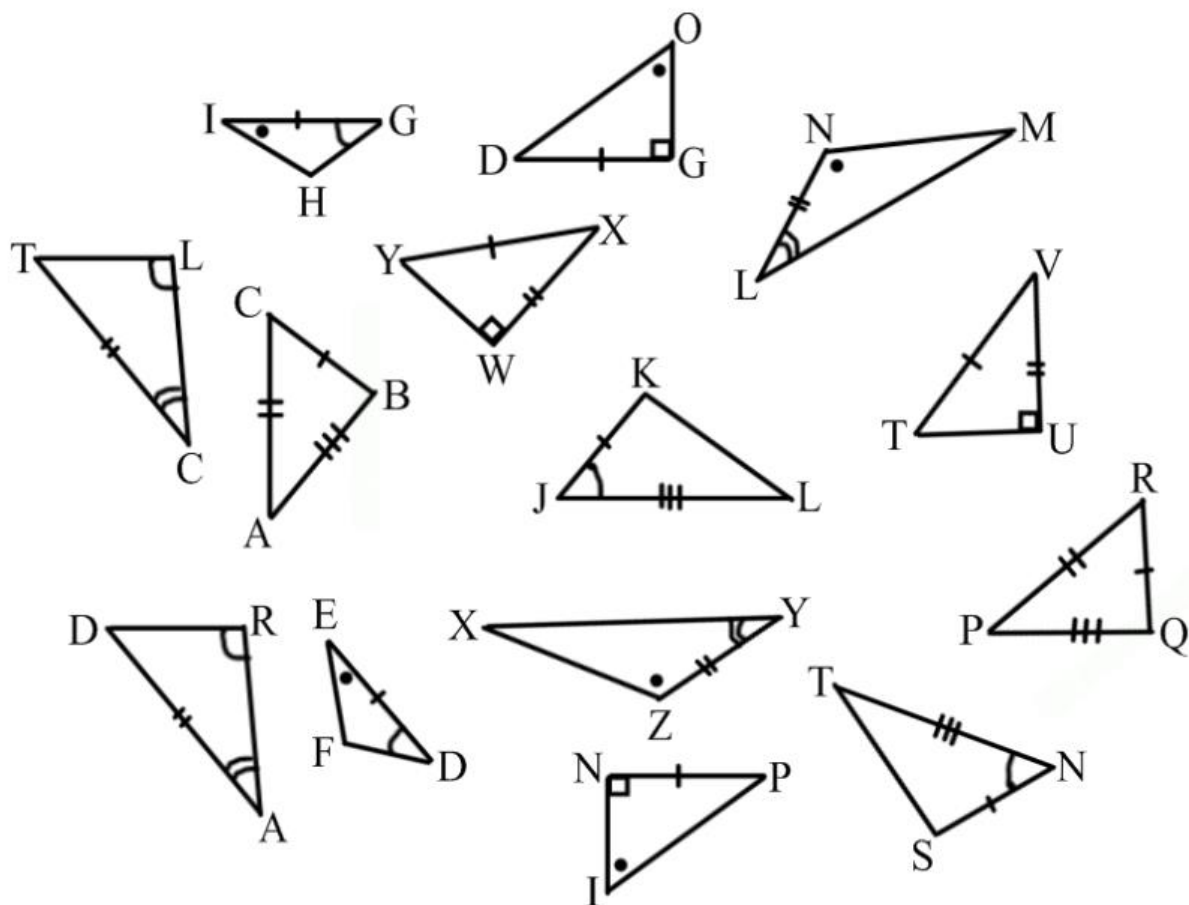


- Hypotenuse-Leg (HL)

If the hypotenuse and a leg of one right-triangle are equal to the hypotenuse and a leg of a second right triangle, then the triangles are congruent.

Example 1: Use Congruence Postulates to Determine Congruency

For the following triangles, state which pairs are congruent and state the reason (use the congruence postulates).



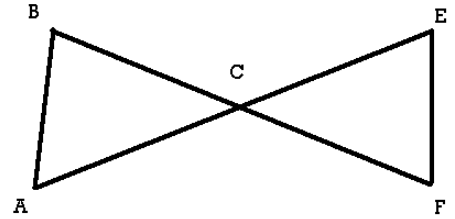
Solution:

Example 2: Use Congruence Postulates when Writing Proofs

Given: Point C is the midpoint of BF, and $AC = EC$

Prove: $AB \parallel EF$

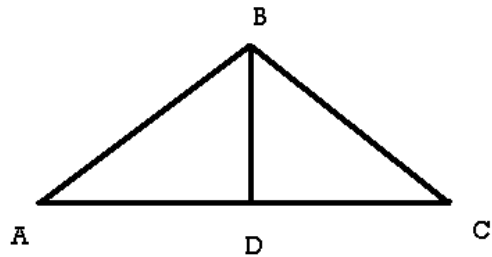
Solution:

**Example 3: Use Congruence Postulates when Writing Proofs**

Given: $AB = BC$, and BD is a median of side AC.

Prove: $\triangle ABD \cong \triangle CBD$

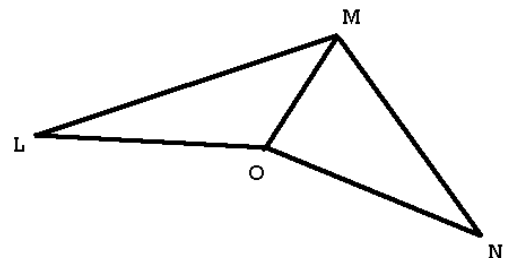
Solution:

**Example 4: Use Congruence Postulates when Writing Proofs**

Given: OM bisects $\angle LMN$, and $\angle LOM = \angle NOM$

Prove: $LO \cong NO$

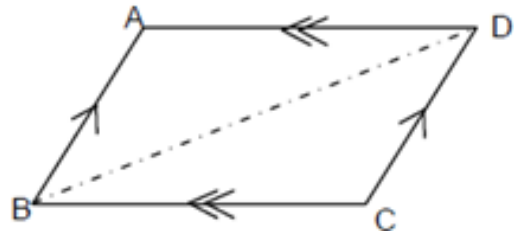
Solution:



Example 5: Use Congruence Postulates when Writing Proofs

Given: Parallelogram ABCD

Prove: that the opposite sides of a parallelogram are congruent.

**Example 6: Use Congruence Postulates when Writing Proofs**

Given: $BA \perp AD$, $BC \perp CD$, and $AB = CB$

Prove: $\triangle ABD \cong \triangle CBD$

Solution:

