

4-6

Congruence in Right Triangles

Content Standard
G.SRT.5 Use congruence . . . criteria to solve problems and prove relationships in geometric figures.

Objective To prove **right triangles** congruent using the Hypotenuse-Leg Theorem

In a right triangle, the side opposite the right angle is called the **hypotenuse**. It is the longest side in the triangle. The other two sides are called **legs**.

The right angle always "points" to the hypotenuse.

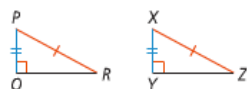


Take note

Theorem 4-6 Hypotenuse-Leg (HL) Theorem

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

If . . .
 $\triangle PQR$ and $\triangle XYZ$ are right \triangle ,
 $\overline{PR} \cong \overline{XZ}$, and $\overline{PQ} \cong \overline{XY}$



Then . . .
 $\triangle PQR \cong \triangle XYZ$

Take note

Key Concept Conditions for HL Theorem

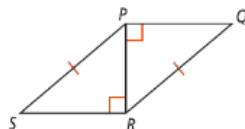
To use the HL Theorem, the triangles must meet three conditions.

Conditions

- There are two right triangles.
- The triangles have congruent hypotenuses.
- There is one pair of congruent legs.

Got It? 1. a. Given: $\angle PRS$ and $\angle RPQ$ are right angles, $\overline{SP} \cong \overline{QR}$

Prove: $\triangle PRS \cong \triangle RPQ$



Statements

Reasons

1. $\angle PRS$ and $\angle RPQ$ are right \angle s

1. Given

$\overline{SP} \cong \overline{QR}$

2. $\triangle PRS$ and $\triangle RPQ$ are right \triangle s

2. def. of right \triangle s

3. $\overline{PR} \cong \overline{RP}$

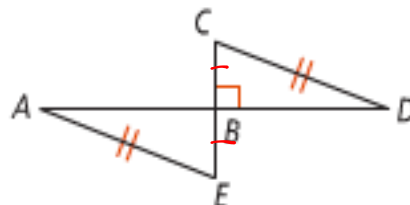
3. Reflexive Prop. \cong

4. $\triangle PRS \cong \triangle RPQ$

4. HL

Got It? 2. **Given:** $\overline{CD} \cong \overline{EA}$, \overline{AD} is the perpendicular bisector of \overline{CE}

Prove: $\triangle CBD \cong \triangle EBA$



Statements

Reasons

1. $\overline{CD} \cong \overline{EA}$

1. Given

\overline{AD} is the \perp bisector of \overline{CE}

2. $\angle CBD$ and $\angle EBA$ are right \angle s

2. def. of \perp

3. $\triangle CBD$ and $\triangle EBA$ are right \triangle s

3. def. of right \triangle s

4. $\overline{CB} \cong \overline{EB}$

4. def. of bisect

5. $\triangle CBD \cong \triangle EBA$

5. HL

Name

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