

Section 8 – Topic 3 Proving Right Triangles Congruent

Let's review the four postulates that can be used to prove triangles congruent.

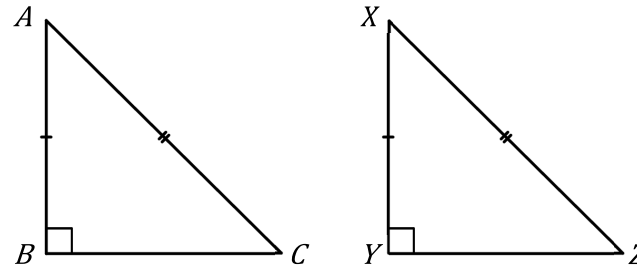
Hypotenuse-Leg (HL) Theorem is another way to prove triangles congruent.

TAKE NOTE!
Postulates &
Theorems

The Hypotenuse-Leg (HL) Theorem

Two right triangles are said to be congruent if their corresponding hypotenuse and one of the two remaining sides are congruent.

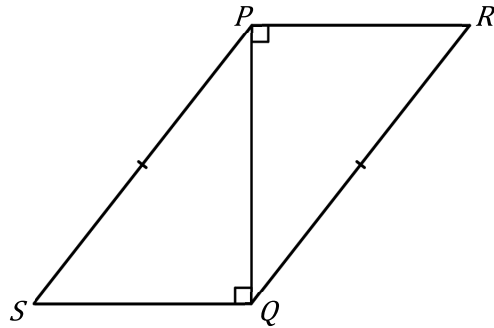
Consider the diagram below.



List three statements that prove the triangles congruent by HL Theorem.

Let's Practice

1. Consider ΔSQP and ΔRPQ in the diagram below. Complete the two column proof.

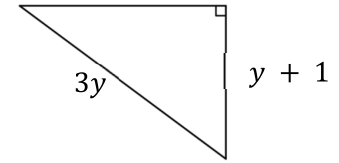
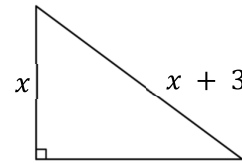


Given: ΔSQP and ΔRPQ are right triangles and $\overline{SP} \cong \overline{QR}$.

Prove: $\Delta SQP \cong \Delta RPQ$

Statements	Reasons
1. ΔSQP and ΔRPQ are right triangles.	1.
2.	2. Given
3.	3. Reflexive Property of congruence
4. $\Delta SQP \cong \Delta RPQ$	4.

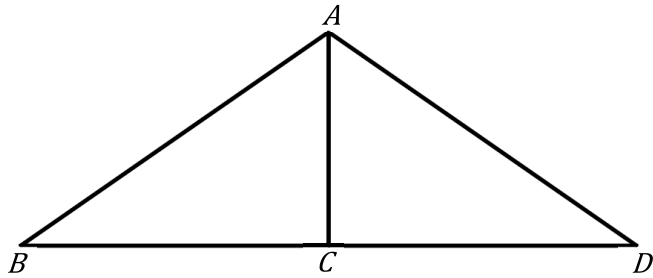
2. Consider the following diagrams.



Find the values of x and y that prove the two triangles congruent by the HL Theorem.

Try It!

3. Consider $\triangle ABC$ and $\triangle ADC$ in the diagram below. Complete the two column proof.

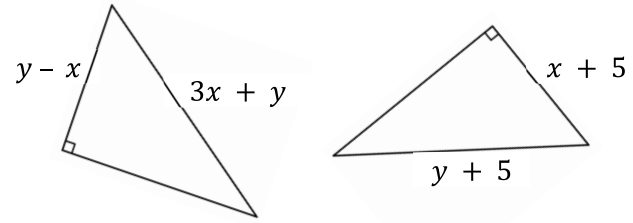


Given: \overline{AC} is perpendicular to \overline{BD} ; $\overline{AB} \cong \overline{AD}$

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

Statements	Reasons
1. \overline{AC} is perpendicular to \overline{BD} .	1. Given
2. $\angle ACB$ and $\angle ACD$ are right angles.	2.
3. $\overline{AB} \cong \overline{AD}$	3. Given
4. $\overline{AC} \cong \overline{AC}$	4.
5. $\triangle ABC \cong \triangle ADC$	5.

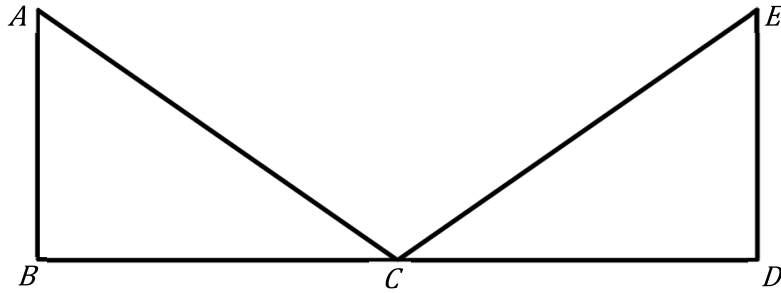
4. Consider the diagrams below.



Find the values of x and y so that the right triangles above are congruent.

BEAT THE TEST!

1. Engineers are designing a new bridge to cross the Intracoastal Waterway. Below is a diagram that represents a partial side view of the bridge. The bridge must be designed so that $\triangle ABC \cong \triangle EDC$. Engineers have measured the support beams, represented by \overline{AC} and \overline{EC} in the diagram, and found they are both 120 ft long. The engineers also determined beams \overline{AB} and \overline{ED} are perpendicular to the bridge, \overline{BD} . Point C represents the midpoint of \overline{BD} .



Complete the two-column proof on the next page to prove $\triangle ABC \cong \triangle EDC$.

Statements	Reasons
1.	1. Given
2. $\overline{AB} \perp \overline{BD}$ and $\overline{ED} \perp \overline{BD}$	2.
3.	3. Definition of a midpoint
4. $\angle ABC$ and $\angle EDC$ are right angles.	4.
5. $\triangle ABC \cong \triangle EDC$	5.