Geometry H — Name : ______________________________
Section 4.4 H-L Notes — Date : ______________________ Period : ___

LEARNING TARGETS

- I can prove triangles congruent using H-L

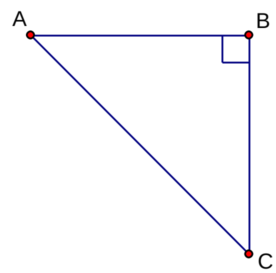
Vocabulary:

In a right triangle, the side opposite the right angle is called the ______________________.

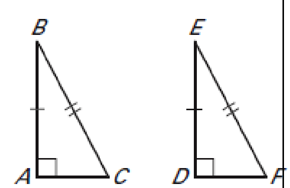
In a right triangle, the sides that form the right angle are called the ____________________.

In right triangle *ABC*, the hypotenuse is _________.

The legs are _________ and _________.



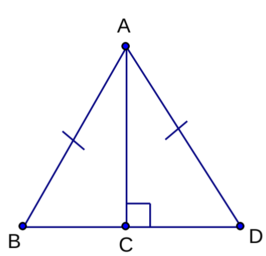
There is a special method for proving right triangles are congruent. This method only works for right triangles!

Hypotenuse – Leg Theorem (H-L)	**Example:**
If the hypotenuse and leg of one right triangle are congruent to the hypotenuse and leg of a second right triangle, then the two triangles are congruent.	If **Hypotenuse** $\overline{BC} \cong$ _______ and **Leg** $\overline{AB} \cong$ _______ in right triangles ΔABC *and* ΔDEF , then $\Delta ABC \cong$ _________ 

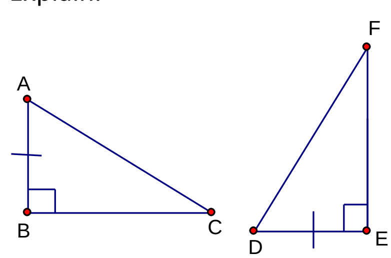
<u>Example 1: Using H-L to identify congruent triangles</u>

Can you prove the following triangles are congruent? Explain.

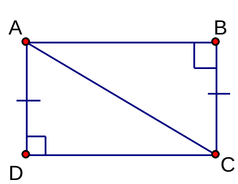
a.



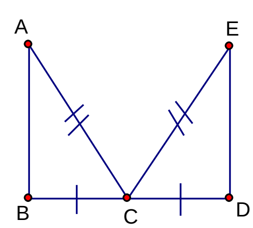
b.



c.



d.



When writing a proof using H-L, it is important that you state the following three things in your explanation:

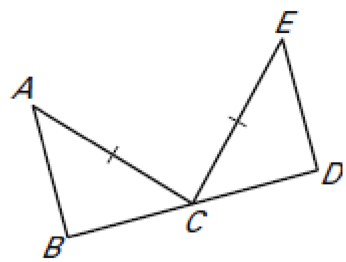
- **That the two triangles are right triangles.**
- **One pair of legs is congruent.**
- **The two hypotenuse are congruent.**

Example 2: Proofs involving H-L

a) **Given:** $\overline{AC} \cong \overline{EC}$; $\overline{AB} \perp \overline{BD}$; $\overline{ED} \perp \overline{BD}$;

$\overline{AC}$ *is a bisector of* $\overline{BD}$

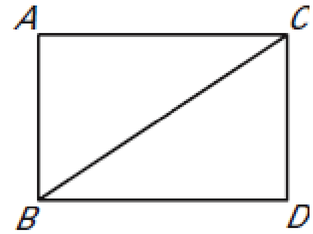
Prove: $\Delta ABC \cong \Delta EDC$



Statements	Reasons
1. $\overline{AC} \cong \overline{EC}$	**1.**
2. $\overline{AB} \perp \overline{BD}$; $\overline{ED} \perp \overline{BD}$	**2.**
3.	**3.**
4.	**4.**
5.	**5.**
6.	**6.**
7. $\Delta ABC \cong \Delta EDC$	**7.**

b) **Given:** $\overline{AB} \cong \overline{DC}; \overline{BA} \perp \overline{AC}; \overline{CD} \perp \overline{DB}$

Prove: $\Delta ABC \cong \Delta DCB$

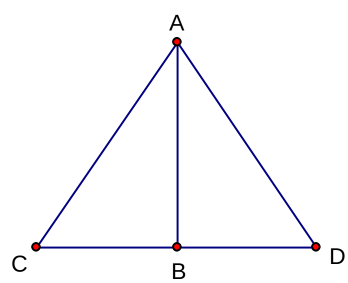


Statements	Reasons
1. $\overline{AB} \cong \overline{DC}$	**1.**
2. $\overline{BA} \perp \overline{AC}; \overline{CD} \perp \overline{DB}$	**2.**
3.	**3.**
4.	**4.**
5.	**5.**
6. $\Delta ABC \cong \Delta DCB$	**6.**

Does a right angle always mean we will use H-L? Let's see!

Given: $\overline{AB}$ is perpendicular bisector of $\overline{CD}$

Prove: $\Delta ABC \cong \Delta ABD$



Statements	Reasons
1. $\overline{AB}$ is perpendicular bisector of $\overline{CD}$	**1.**
2.	**2.**
3.	**3.**
4.	**4.**
5.	**5.**
6. $\Delta ABC \cong \Delta ABD$	**6.**