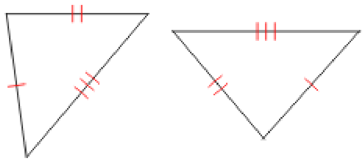
Unit 4 Lesson 6 - Proving Congruence in Triangles

Recall triangle congruence postulates:

- ______________________________(SSS) Congruence – If three sides of one triangle are congruent to three sides of a second triangle, then the triangles are congruent.
- ______________________________(SAS) Congruence – If two sides and the included angle of one triangle are congruent to two sides and the included angle of a second triangle, then the triangles are congruent.
- ______________________________(ASA) Congruence – If two angles and the included side of one triangle are congruent to two angles and the included side of another triangle, then the triangles are congruent.
- ______________________________(AAS) Congruence – If two angles and the non-included side of one triangle are congruent to the corresponding two angles and side of a second triangle, then the two triangles are congruent.

Determine whether the two triangles below are congruent. If they are, which postulate above proves congruence:

1)


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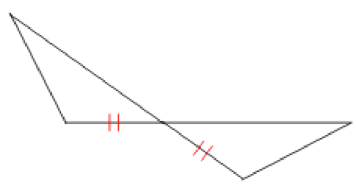

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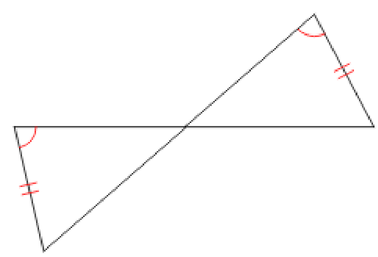

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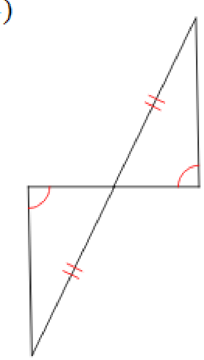

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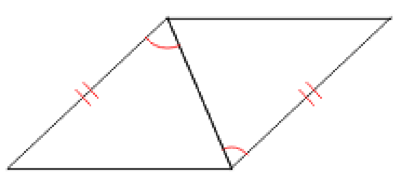

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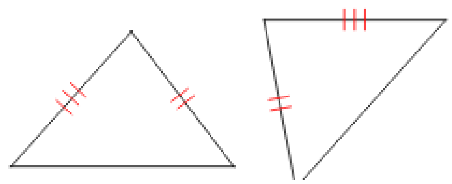

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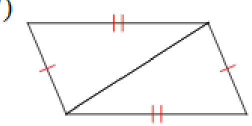

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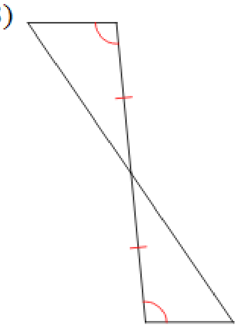

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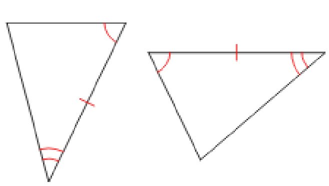

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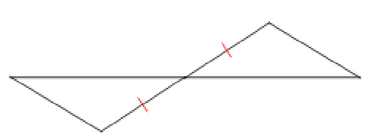

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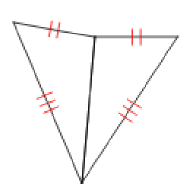

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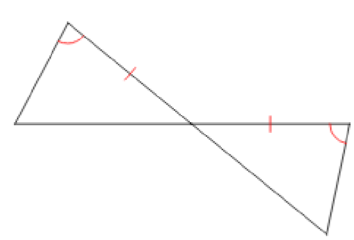
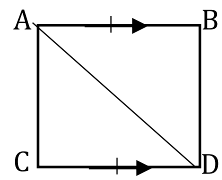


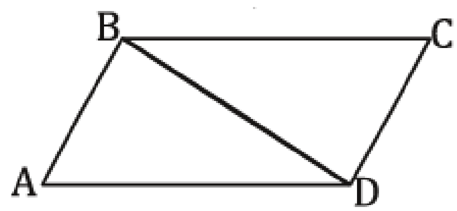
Proving Triangles Congruent

- Reflexive Property of Triangle Congruence → $\Delta ABC \cong \Delta ABC$
- Symmetric Property of Triangle Congruence → If $\Delta ABC \cong \Delta EFG$, then $\Delta EFG \cong \Delta ABC$



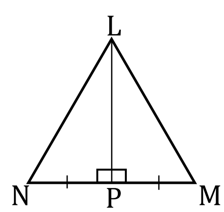
Given the figure below, prove that $\Delta ACD \cong \Delta CAB$.

Statement	Reason
1. $AB = CD, \overline{AB} \parallel \overline{CD}$	
2. $\angle BAD \cong \angle ADC$	
3. $AD = AD$	
4. $\Delta ACD \cong \Delta ADB$	



Given $\overline{AB} \cong \overline{CD}, \overline{AD} \cong \overline{CB}$, prove Δ**ABD** $\cong \Delta$**CBD**.

Statement	Reason
1. $\overline{AB} \cong \overline{CD}$	
2. $\overline{AD} \cong \overline{CB}$	
3. $\overline{BD} \cong \overline{BD}$	
4. $\Delta ABD \cong \Delta CBD$	

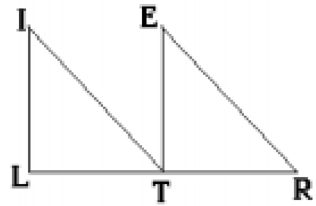


Given the figure below, prove that $\Delta NPL \cong \Delta MPL$.

Statement	Reason
1. $NP = PM, \overline{NP} \perp \overline{PL}$	
2. $\angle MPL$ is a right angle $\angle NPL$ is a right angle	
3. $PL = PL$	
4. $\Delta NPL \cong \Delta MPL$	

Writing proofs without statements:

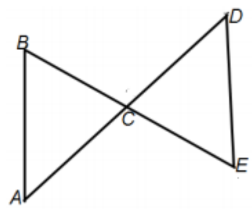
1. Start with the given information.
2. Fill in properties/theorems you can infer.
3. End with what you are trying to prove.



Given: $\overline{LT} \cong \overline{TR}, \angle ILT \cong \angle ETR, IT \parallel ER$

Prove: $\Delta LIT \cong \Delta TER$

Statement	Reason
1.	
2.	
3.	
4.	
5.	

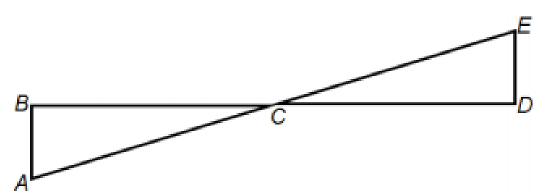


Given: $\overline{BA} \cong \overline{ED}$

C is the midpoint of $\overline{BE}$ and $\overline{AD}$

Prove: $\Delta ABC \cong \Delta DEC$

Statement	Reason
1.	
2.	
3.	
4.	
5.	



Given: C is the midpoint of $\overline{BD}$. $\overline{AB} \perp \overline{BD}$, $\overline{BD} \perp \overline{DE}$

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

Statement	Reason
1.	
2.	
3.	
4.	
5.	
6.	
7.	