Geometry: 5.5-5.7 Notes

NAME_____

5.5 Prove triangle congruent with SSS and HL **Date:**_____

Define Vocabulary:

Legs (of a right triangle) –

Hypotenuse –

Theorem 5.8 Side-Side-Side (SSS) Congruence Theorem

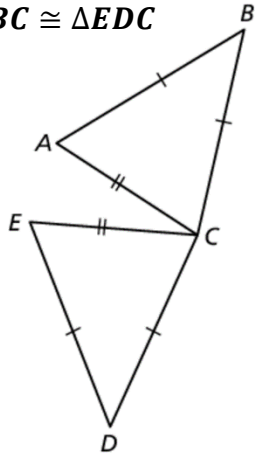
If three sides of one triangle are congruent to three sides of a second triangle, then the two triangles are congruent.

If $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, and $\overline{AC} \cong \overline{DF}$, then $\Delta ABC \cong \Delta DEF$.

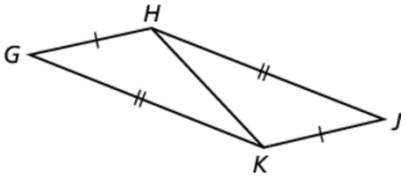
Examples: Decide whether the congruence statement is true. Explain your reasoning.

WE DO

$\Delta ABC \cong \Delta EDC$

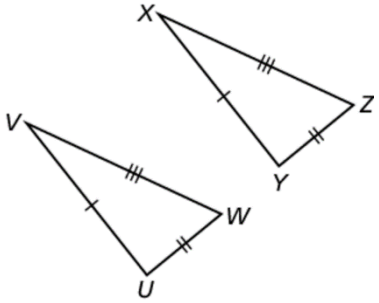


$\Delta KGH \cong \Delta HJK$

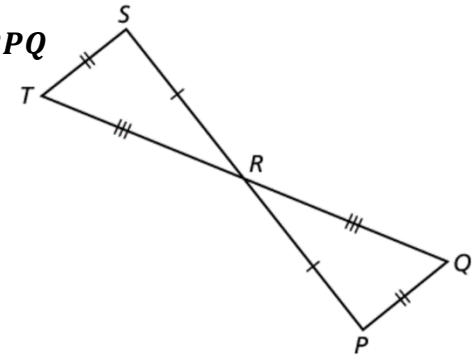


YOU DO

$\Delta UVW \cong \Delta XYZ$

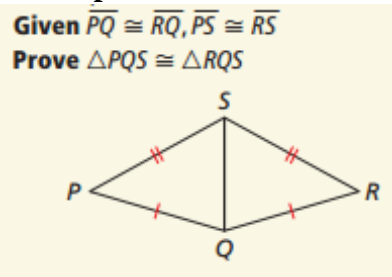


$\Delta RST \cong \Delta RPQ$



Examples: Write a proof.

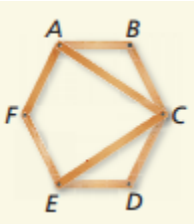
WE DO

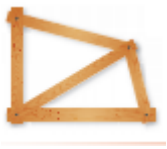


Statements	Reasons

Examples: Determine whether the figure is stable. Explain your answer.

WE DO

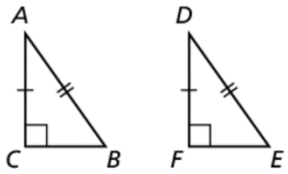




YOU DO

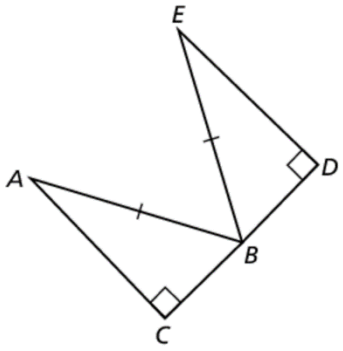
Theorem 5.9 Hypotenuse-Leg (HL) Congruence Theorem

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



If $\overline{AB} \cong \overline{DE}, \overline{AC} \cong \overline{DF}$, and $m\angle C = m\angle F = 90°$, then $\Delta ABC \cong \Delta DEF$.

Examples: Write a proof.



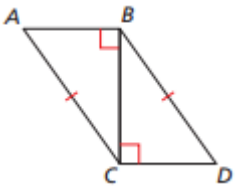
WE DO

Given: *B* is the midpoint of $\overline{CD}$, $\overline{AB} \cong \overline{EB}$, $\angle C$ and $\angle D$ are right angles.

Prove: $\Delta ABC \cong \Delta EBD$

Statements	Reasons

YOU DO



Given: Use the information in the diagram.

Proof: $\Delta ABC \cong \Delta DCB$

Statements	Reasons

Assignment	

5.6 Proving triangle congruence by ASA and AAS. _____ Date:_____

Define Vocabulary:

congruent figures –

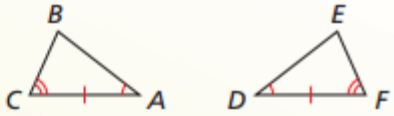
rigid motion –

Theorem 5.10 Angle-Side-Angle (ASA) Congruence Theorem

If two angles and the included side of one triangle are congruent to two angles and the included side of a second triangle, then the two triangles are congruent.

If $\angle A \cong \angle D$, $\overline{AC} \cong \overline{DF}$, and $\angle C \cong \angle F$, then $\triangle ABC \cong \triangle DEF$.

Proof p. 270

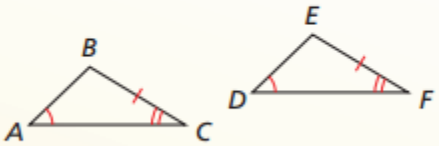


Theorem 5.11 Angle-Angle-Side (AAS) Congruence Theorem

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

If $\angle A \cong \angle D$, $\angle C \cong \angle F$, and $\overline{BC} \cong \overline{EF}$, then $\triangle ABC \cong \triangle DEF$.

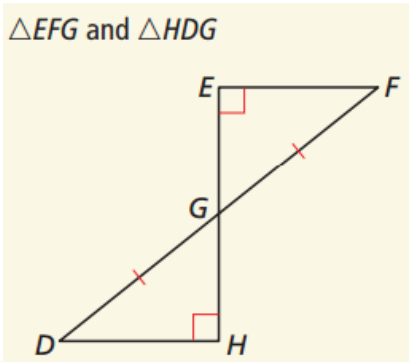
Proof p. 271



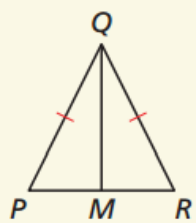
Examples: Can the triangles be proven congruent with the information given in the diagram. If so, state the theorem you used.

WE DO

$\triangle EFG$ and $\triangle HDG$

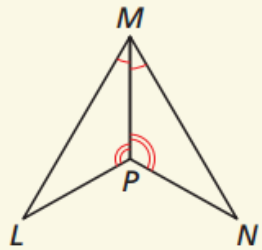


$\triangle PQM$ and $\triangle RQM$

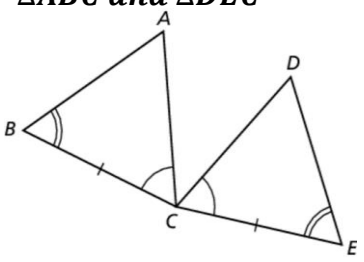


YOU DO

$\triangle LMP$ and $\triangle NMP$



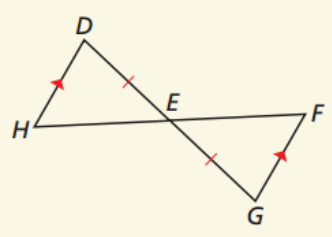
ΔABC *and* ΔDEC



Examples: Write a proof.

WE DO

Given $\overline{DH} \parallel \overline{FG}$, $\overline{DE} \cong \overline{EG}$
Prove $\triangle DEH \cong \triangle GEF$



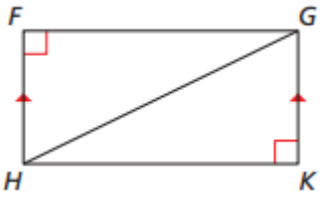
Statements	Reasons

Examples: Write a proof.

WE DO

Given $\overline{HF} \parallel \overline{GK}$, $\angle F$ and $\angle K$ are right angles.

Prove: $\Delta HFG \cong \Delta GKH$

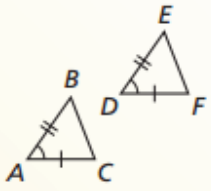
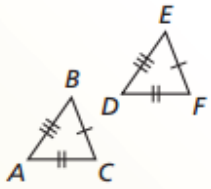
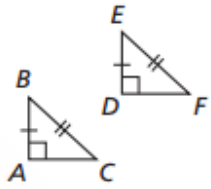
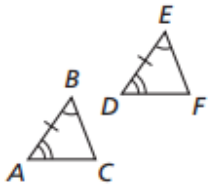
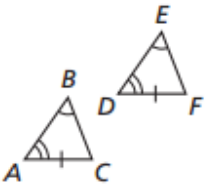


Statements	Reasons

Concept Summary

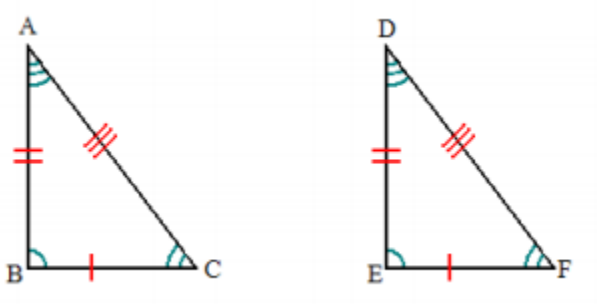
Triangle Congruence Theorems

You have learned five methods for proving that triangles are congruent.

SAS	SSS	HL (right △ only)	ASA	AAS
				
Two sides and the included angle are congruent.	All three sides are congruent.	The hypotenuse and one of the legs are congruent.	Two angles and the included side are congruent.	Two angles and a non-included side are congruent.

Assignment	

CPCTC: Corresponding Parts of Congruent Triangles are Congruent

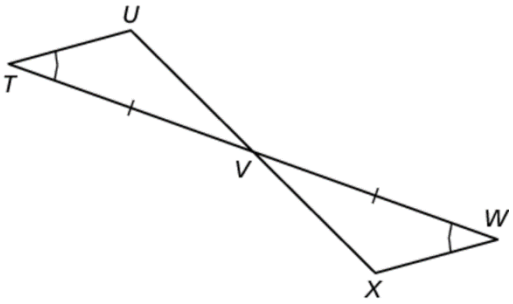


Note: You must prove triangles congruent before you can use CPCTC!

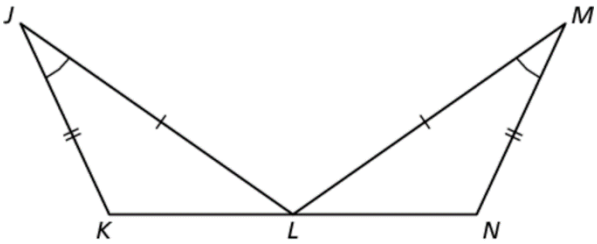
Examples: Explain how to prove the statements true.

WE DO

$\overline{UV} \cong \overline{XV}$

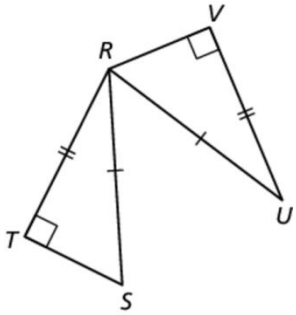


$\angle JLK \cong \angle MLN$



YOU DO

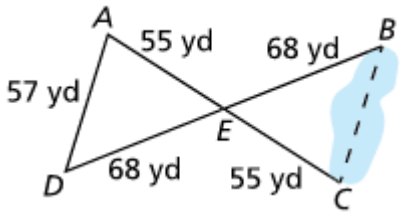
$\overline{TS} \cong \overline{VR}$



Examples: Use congruent triangles for measurement.

WE DO

Explain how to use the measurements in the diagram to find the distance across the pond.

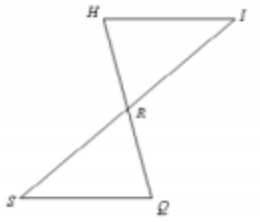


Examples: Write a proof to show corresponding parts are congruent.

WE DO

Given: R **is the midpoint of** $\overline{SI}$
$\angle S \cong \angle I$

Prove: $\angle Q \cong \angle H$



WHY ARE THE TRIANGLES CONGRUENT?_____

Statements	Reasons

Assignment	