

## 5.1 Congruence and Triangles

**Goal: Classify triangles by their sides and by their measures.**

**Corresponding Parts:** the sides and angles that are the same when two triangles have exactly the same

\_\_\_\_\_ and \_\_\_\_\_

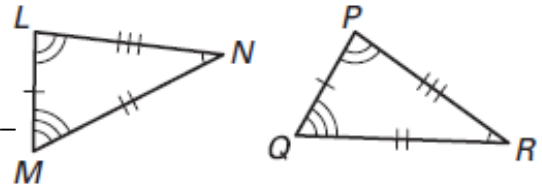
**Congruent Figures:** figures are congruent if all pairs of corresponding \_\_\_\_\_ and corresponding

\_\_\_\_\_ are congruent

**The two triangles are congruent. Identify all congruent parts and write a congruence statement.**

Corresponding Angles:

\_\_\_\_\_ and \_\_\_\_\_    \_\_\_\_\_ and \_\_\_\_\_    \_\_\_\_\_ and \_\_\_\_\_



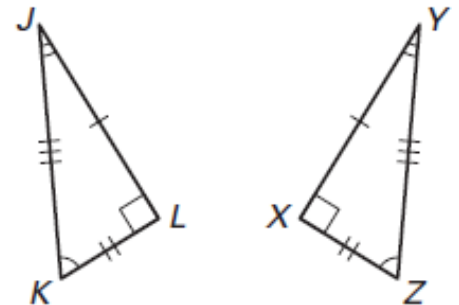
Corresponding Sides:

\_\_\_\_\_ and \_\_\_\_\_    \_\_\_\_\_ and \_\_\_\_\_    \_\_\_\_\_ and \_\_\_\_\_

Congruence Statement:  $\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_

Corresponding Angles:

\_\_\_\_\_ and \_\_\_\_\_    \_\_\_\_\_ and \_\_\_\_\_    \_\_\_\_\_ and \_\_\_\_\_



Corresponding Sides:

\_\_\_\_\_ and \_\_\_\_\_    \_\_\_\_\_ and \_\_\_\_\_    \_\_\_\_\_ and \_\_\_\_\_

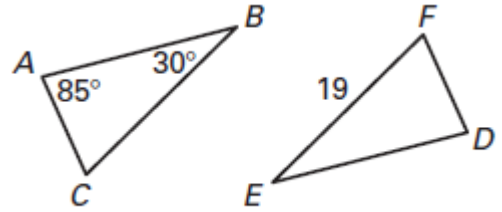
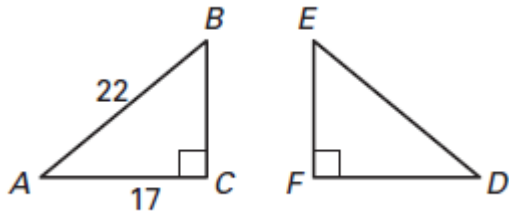
Congruence Statement:  $\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_

In the triangles below,  $\triangle ABC \cong \triangle DEF$ . Find the indicated measures.

DE = \_\_\_\_\_ DF = \_\_\_\_\_

BC = \_\_\_\_\_  $m\angle D =$  \_\_\_\_\_  $m\angle E =$  \_\_\_\_\_

$m\angle C =$  \_\_\_\_\_  $m\angle F =$  \_\_\_\_\_



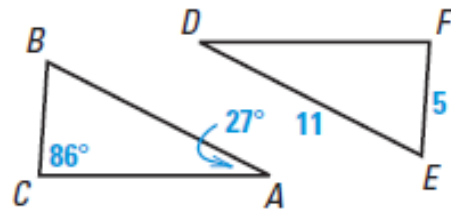
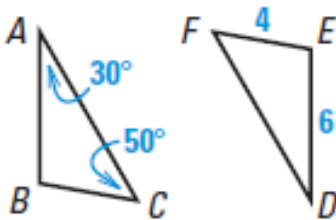
In the triangles below,  $\triangle ABC \cong \triangle DEF$ . Find the indicated measures.

AB = \_\_\_\_\_ BC = \_\_\_\_\_  $m\angle D =$  \_\_\_\_\_

BC = \_\_\_\_\_  $m\angle D =$  \_\_\_\_\_  $m\angle F =$  \_\_\_\_\_

$m\angle F =$  \_\_\_\_\_  $m\angle B =$  \_\_\_\_\_  $m\angle E =$  \_\_\_\_\_

AB = \_\_\_\_\_  $m\angle B =$  \_\_\_\_\_  $m\angle E =$  \_\_\_\_\_



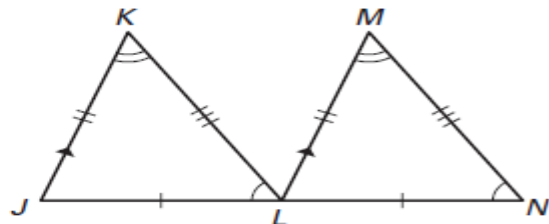
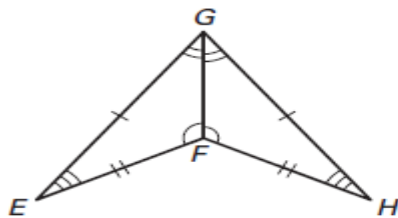
Determine whether the triangles are congruent. If so, write a congruence statement.

a) Congruent? \_\_\_\_\_

b) Congruent? \_\_\_\_\_

Statement:  $\triangle$  \_\_\_\_\_  $\cong$   $\triangle$  \_\_\_\_\_

Statement:  $\triangle$  \_\_\_\_\_  $\cong$   $\triangle$  \_\_\_\_\_

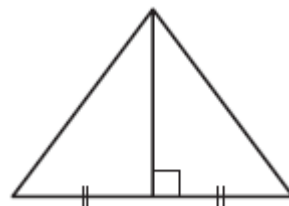
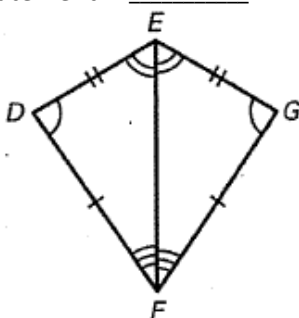


c) Congruent? \_\_\_\_\_

d) Congruent? \_\_\_\_\_

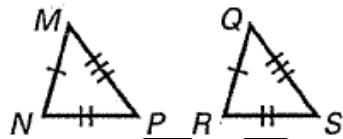
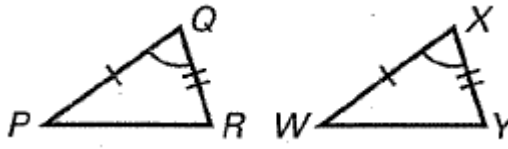
Statement:  $\triangle$  \_\_\_\_\_  $\cong$   $\triangle$  \_\_\_\_\_

Statement:  $\triangle$  \_\_\_\_\_  $\cong$   $\triangle$  \_\_\_\_\_

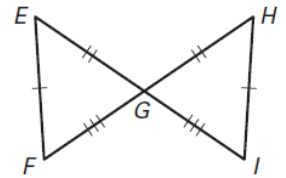
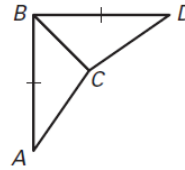
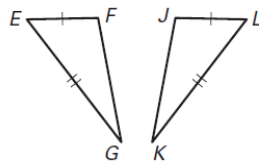
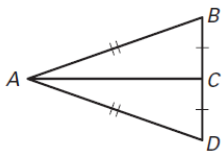


## 5.2 SSS and SAS

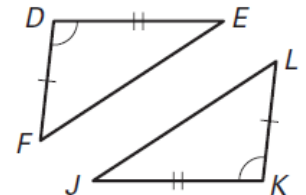
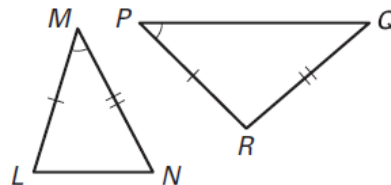
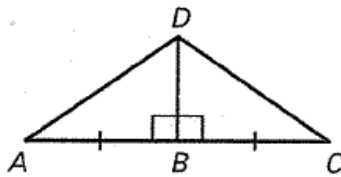
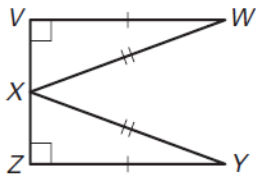
**Goal: Show triangles are congruent using SSS and SAS.**

<p><b>Side-Side-Side (SSS) Congruent Postulate:</b> If three _____ of one triangles are congruent to three _____ of a second triangle, then the two triangles are _____</p>	<div style="text-align: center;">  <p>If Side <math>\overline{MN} \cong \overline{QR}</math>, and  Side <math>\overline{NP} \cong \overline{RS}</math>, and  Side <math>\overline{PM} \cong \overline{SQ}</math>,  then <math>\triangle MNP \cong \triangle</math> _____.</p> </div>
<p><b>Side-Angle-Side (SAS) Congruent Postulate:</b> If two sides and the included angle of one triangle are congruent to two sides and the _____ angle of a second triangle, then the triangles are _____</p>	<div style="text-align: center;">  <p>If Side <math>\overline{PQ} \cong \overline{WX}</math>, and  Angle <math>\angle Q \cong \angle X</math>, and  Side <math>\overline{QR} \cong \overline{XY}</math>,  then <math>\triangle PQR \cong \triangle</math> _____.</p> </div>

**Does the diagram give enough information to use the SSS congruence postulate?**



**Does the diagram give enough information to use the SAS congruence postulate?**



Decide if there is enough information is given to show that the triangles are congruent. If so, tell which congruence postulate you would use and write a congruence statement.

a. Congruent? \_\_\_\_\_

b. Congruent? \_\_\_\_\_

c. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

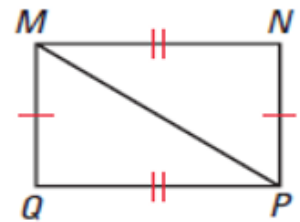
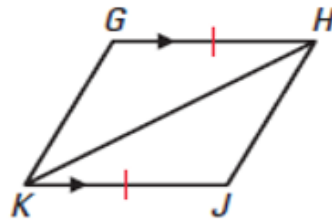
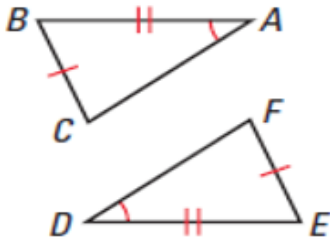
Postulate: \_\_\_\_\_

Postulate: \_\_\_\_\_

$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_

$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_

$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



d. Congruent? \_\_\_\_\_

e. Congruent? \_\_\_\_\_

f. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

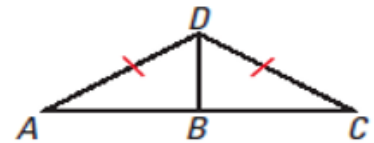
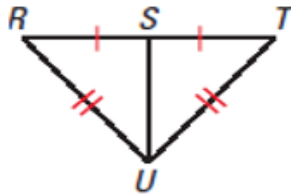
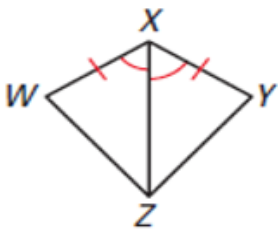
Postulate: \_\_\_\_\_

Postulate: \_\_\_\_\_

$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_

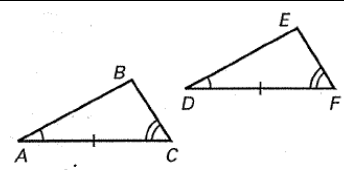
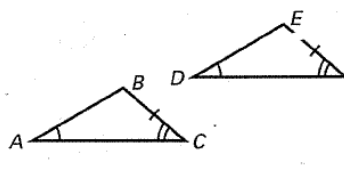
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_

$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



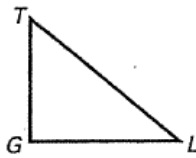
## 5.3 ASA and AAS

**Goal: Show triangles are congruent using ASA and AAS.**

<p><b>Angle-Side-Angle (ASA) Congruent Postulate:</b> If two angles and the included _____ of one triangle are congruent to two _____ the included side of a second triangle, then the two triangles are _____.</p>	<div style="text-align: center;">  </div> <p style="text-align: center;"> <b>If Angle <math>\angle A \cong \angle D</math>, and</b>  <b>Side <math>\overline{AC} \cong \overline{DF}</math>, and</b>  <b>Angle <math>\angle C \cong \angle F</math>,</b>  <b>then <math>\triangle ABC \cong \triangle</math> _____.</b> </p>
<p><b>Angle-Angle-Side (AAS) Congruent Postulate:</b> If two _____ and the non-included side of one triangle are congruent to two angles and the corresponding non-included _____ of a second triangle, then the two triangles are _____.</p>	<div style="text-align: center;">  </div> <p style="text-align: center;"> <b>If Angle <math>\angle A \cong \angle D</math>, and</b>  <b>Angle <math>\angle C \cong \angle F</math>, and</b>  <b>Side <math>\overline{BC} \cong \overline{EF}</math>,</b>  <b>then <math>\triangle ABC \cong \triangle</math> _____.</b> </p>

Use  $\triangle TGL$  shown. Complete the table.

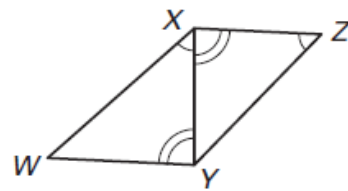
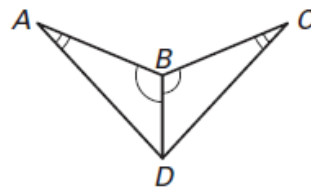
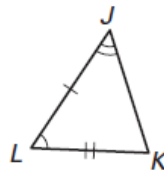
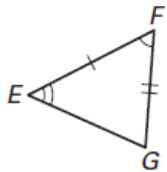
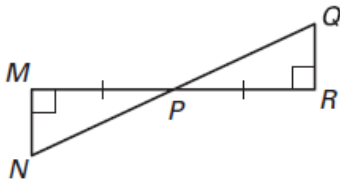
Angles	Included Side
$\angle T$ and $\angle G$	
$\angle G$ and $\angle L$	
$\angle T$ and $\angle L$	



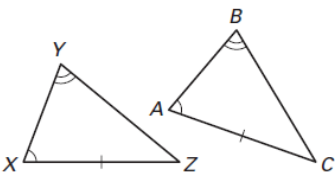
Draw any  $\triangle ABC$  in the space below. Complete the table.

Angles	Non-Included Sides
$\angle A$ and $\angle B$	and
$\angle B$ and $\angle C$	and
$\angle A$ and $\angle C$	and

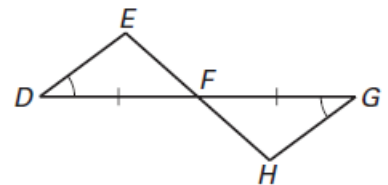
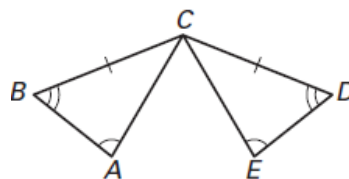
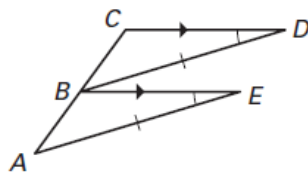
**Does the diagram give enough information to use the ASA congruence postulate?**



**Does the diagram give enough information to use the AAS congruence postulate?**



or

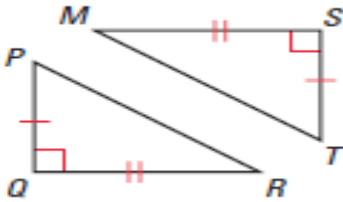


Decide if there is enough information is given to show that the triangles are congruent. If so, tell which congruence postulate you would use and write a congruence statement.

a. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

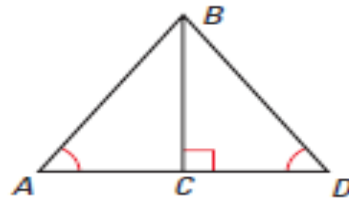
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



b. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

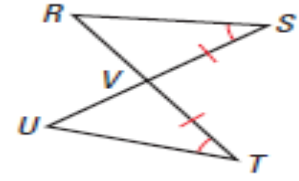
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



c. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

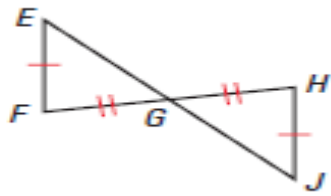
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



d. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

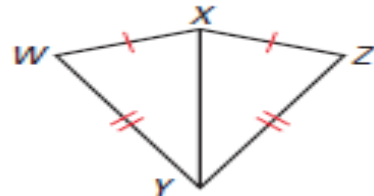
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



e. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

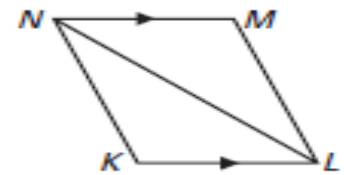
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



f. Congruent? \_\_\_\_\_

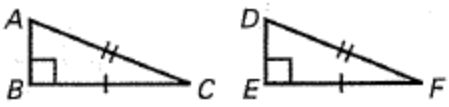
Postulate: \_\_\_\_\_

$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_

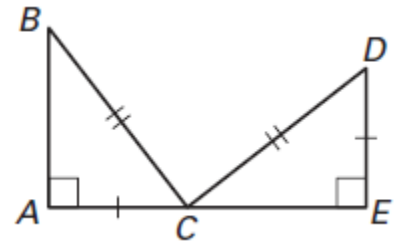
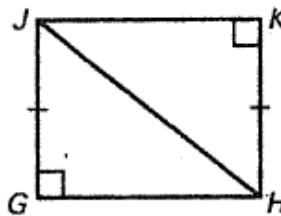
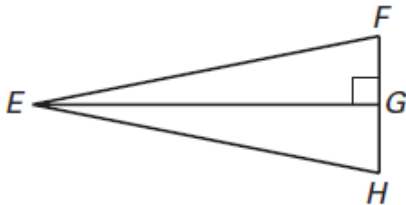
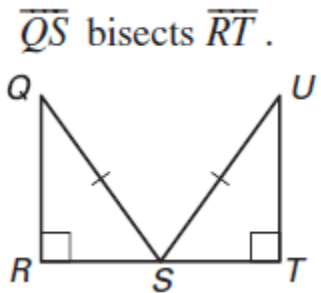
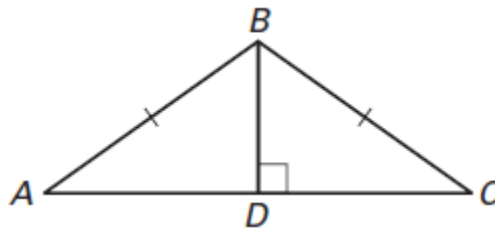
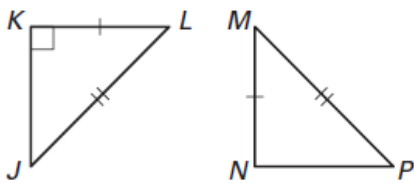


## 5.4 Hypotenuse Leg Congruence Theorem: HL

**Goal:** Use the HL Congruence Theorem to prove triangles congruent.

<p><b>Hypotenuse-Leg Theorem:</b> If the hypotenuse and a leg of a _____ triangle are congruent to the hypotenuse and a leg of a second _____ triangle, then the two triangles are _____.</p>	<div style="text-align: center;">  <p style="text-align: center;"> <math>H \overline{AC} \cong \overline{DF}</math>, and  <math>L \overline{BC} \cong \overline{EF}</math>,                      then <math>\triangle ABC \cong \triangle</math> _____.                 </p> </div>
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**Does the diagram give enough information to use the HL congruence theorem?**



**Decide if there is enough information is given to show that the triangles are congruent. If so, tell which congruence postulate you would use.**

a. Congruent? \_\_\_\_\_

b. Congruent? \_\_\_\_\_

c. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

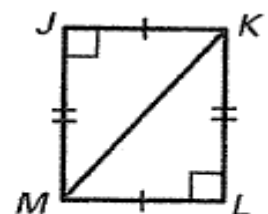
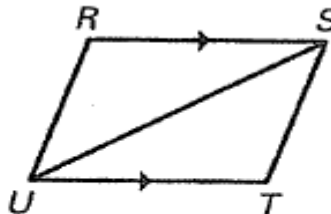
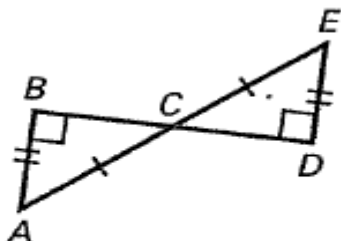
Postulate: \_\_\_\_\_

Postulate: \_\_\_\_\_

$\triangle$  \_\_\_\_\_  $\cong$   $\triangle$  \_\_\_\_\_

$\triangle$  \_\_\_\_\_  $\cong$   $\triangle$  \_\_\_\_\_

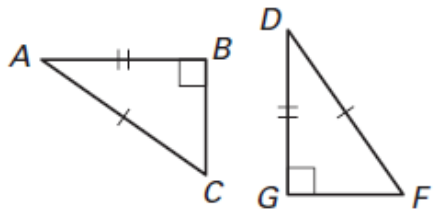
$\triangle$  \_\_\_\_\_  $\cong$   $\triangle$  \_\_\_\_\_



d. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

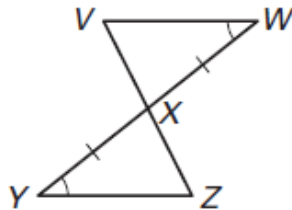
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



e. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

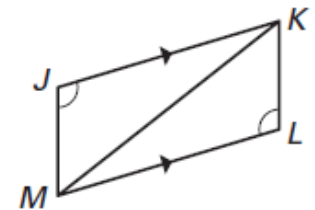
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



f. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

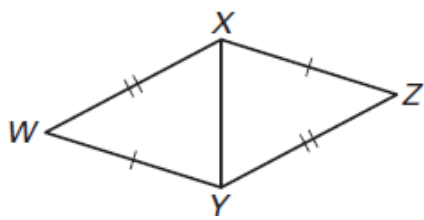
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



g. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

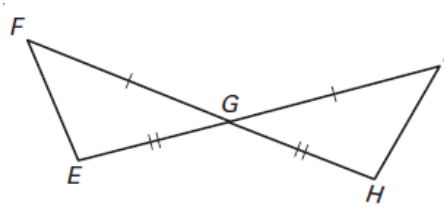
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



h. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

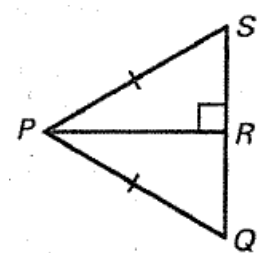
$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_



i. Congruent? \_\_\_\_\_

Postulate: \_\_\_\_\_

$\Delta$  \_\_\_\_\_  $\cong$   $\Delta$  \_\_\_\_\_





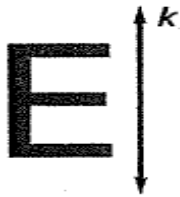
# 5.7 Reflections and Symmetry

Goal: Identify and use reflections and lines of symmetry

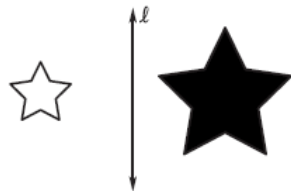
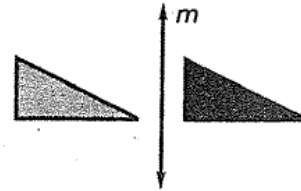
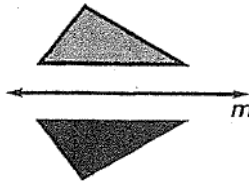
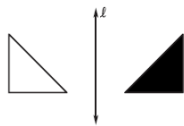
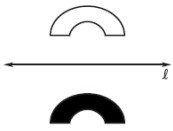
**Reflection:** a transformation that creates a \_\_\_\_\_ image. The original figure is reflected in a line that is called the line of reflection.

Properties of Reflections
1. The reflected image is _____ to the original figure.
2. The orientation of the reflected image is _____.
3. The line of reflection is the _____ of the segments joining the corresponding points.

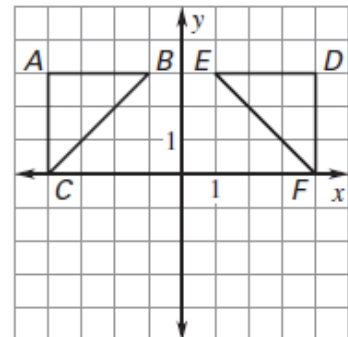
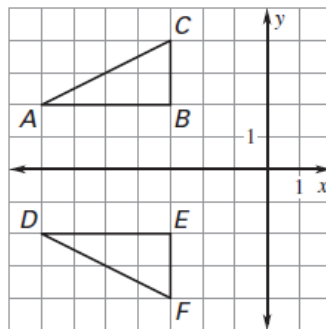
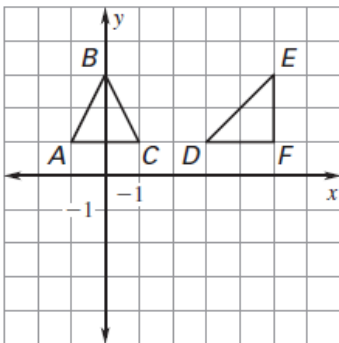
Draw the reflection of the letter E in the line k.



Tell whether the figures are reflections.

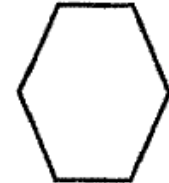
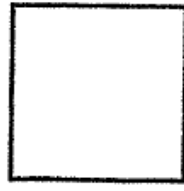
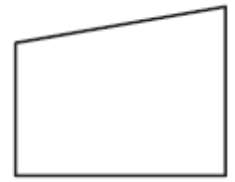
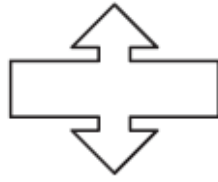
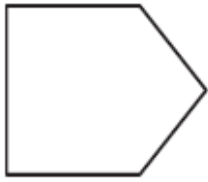


Tell whether the figures are reflections. If they are reflections, name the line of reflection.



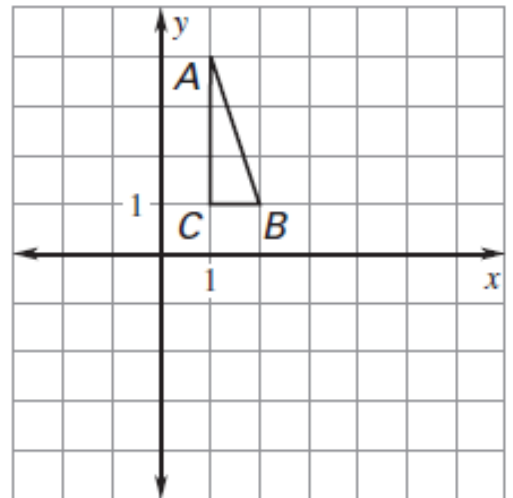
**Line of symmetry:** a line that allows a figure to be reflected onto itself by a reflection in the line.

**Determine the number of lines of symmetry of each figure.**



**Reflect the triangle across the x-axis. Find the coordinates of the pre-image and image.**

A \_\_\_\_\_ A' \_\_\_\_\_  
 B \_\_\_\_\_ B' \_\_\_\_\_  
 C \_\_\_\_\_ C' \_\_\_\_\_



**Reflect the figure across the y-axis. Find the coordinates of the pre-image and image.**

H \_\_\_\_\_ H' \_\_\_\_\_  
 Q \_\_\_\_\_ Q' \_\_\_\_\_  
 P \_\_\_\_\_ P' \_\_\_\_\_  
 L \_\_\_\_\_ L' \_\_\_\_\_

