4.1 Triangles and Congruent Figures

NOTES

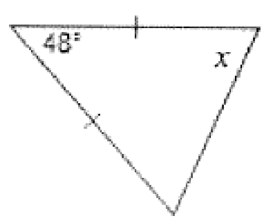
Write your questions here!

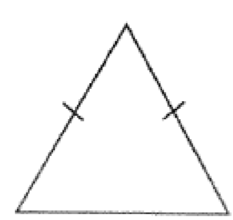
Types of triangles

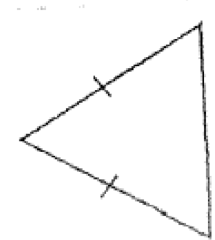
ACUTE	OBTUSE	RIGHT
SCALENE	**ISOSCELES**	**EQUILATERAL**

Isosceles Triangle Theorem		
Theorem If two sides of a triangle are congruent, then	**If…**	**Then…**

Converse of the Isosceles Triangle Theorem		
Theorem If two angles of a triangle are congruent, then	**If…**	**Then…**







Write your questions here!

Equilateral Triangle Theorem		
Theorem If a triangle is equilateral, then	**If…**	**Then…**

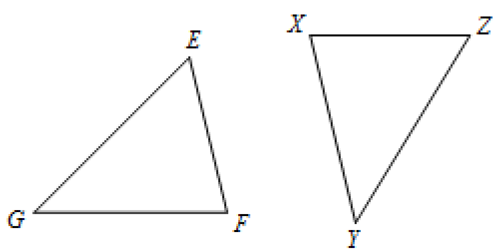
Converse of the Equilateral Triangle Theorem		
Theorem If a triangle is equiangular, then	**If…**	**Then…**

Congruent Figures-

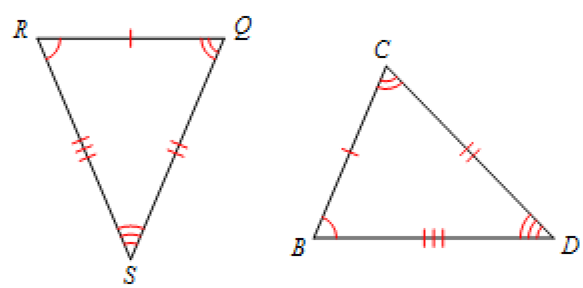
Corresponding Parts-

Example #1

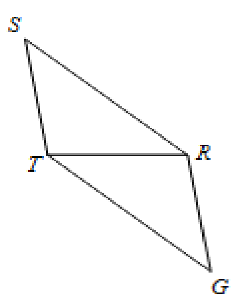
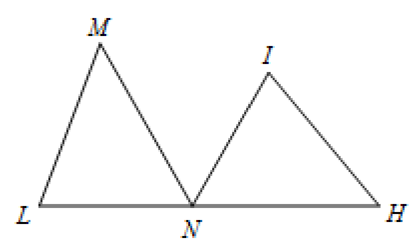
$\Delta EFG \cong \Delta ZXY$



Example #2



Try it!

$\Delta RTS \cong \Delta TRG$  $\overline{SR} \cong ?$	$\Delta ZXY \cong \Delta ZXJ$ $\overline{YZ} \cong ?$	$\Delta LMN \cong \Delta IHN$  $\angle MNL \cong ?$

Summarize your notes:

Now, summarize your notes here!

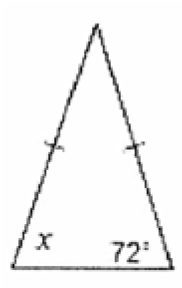
4.1 PRACTICE

Draw the following. Mark the picture!!!

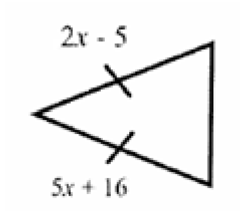
1. Obtuse Isosceles Triangle	2. Acute Equilateral Triangle	3. Right Scalene Triangle

Find *x*.

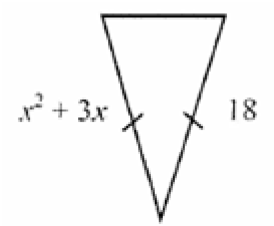
4.



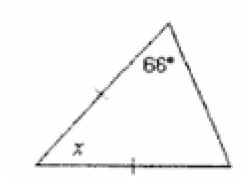
5.



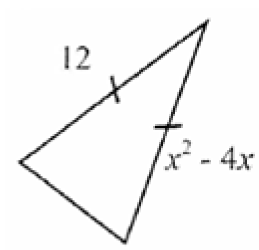
6.



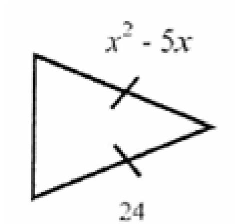
7.



8.

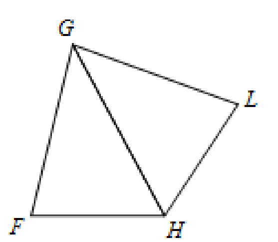


9.

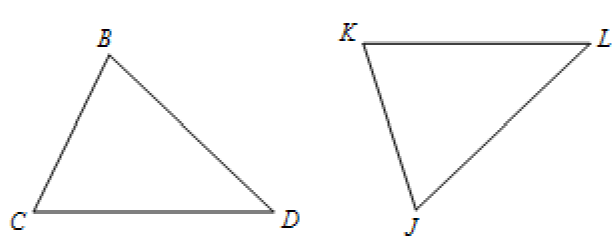


Mark the angles and sides of each pair of triangles to indicate that they are congruent.

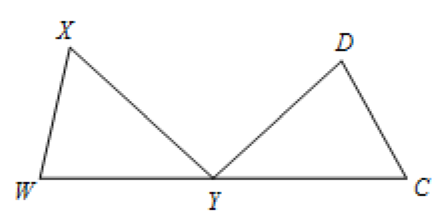
10. $\Delta GHF \cong \Delta GHL$



11. $\Delta CBD \cong \Delta JKL$

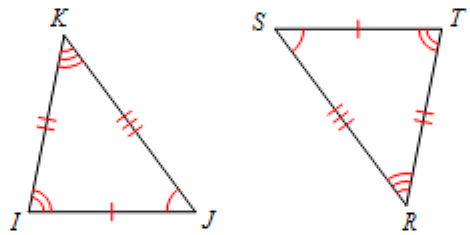


12. $\Delta WXY \cong \Delta DCY$

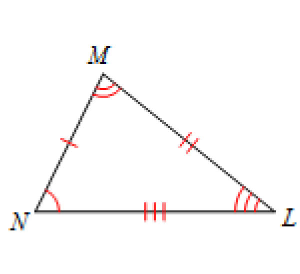


Write a statement indicating that the triangle pair is congruent. ORDER IS IMPORTANT!!!

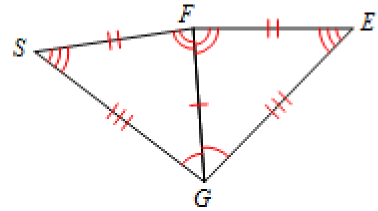
13.



14.



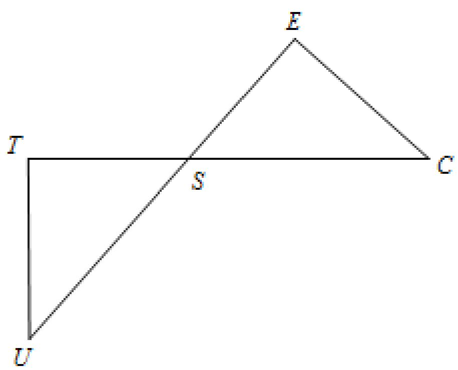
15.



Complete each congruence statement.

16.

$\Delta SUT \cong \Delta SCE$



$\angle U \cong ?$

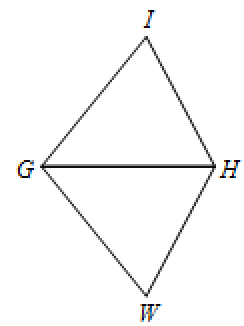
17.

$\Delta VWX \cong \Delta VLM$

$\overline{WX} \cong ?$

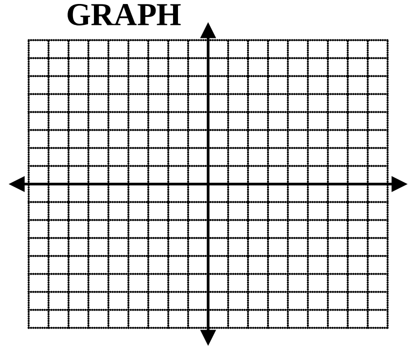
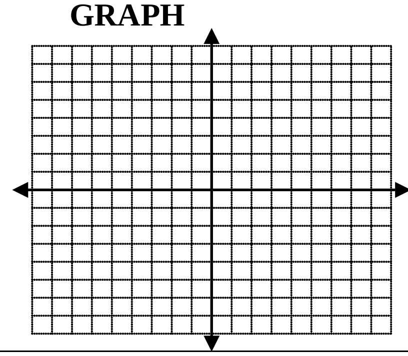
18.

$\Delta HGI \cong \Delta HGW$

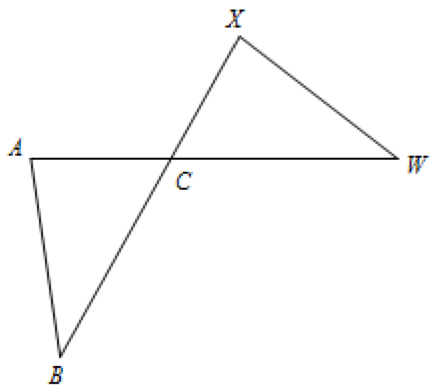
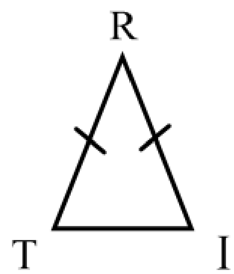


$\overline{GI} \cong ?$

ALGEBRA REVIEW

SOLVE	**GRAPH**	**MULTIPLY**
$2(3x-4)-5=-7$	$y=\frac{3}{4}x$ 	$(2x-3)(x+3)$
SOLVE $\frac{x}{5}=\frac{x+2}{15}$	**GRAPH** $y=x$ 	**FACTOR** $x^2-4x-12$

4.1 APPLICATION

1. Mark the picture. $\Delta CBA \cong \Delta CWX$ 	2. Given $\angle T = x^2$ and $\angle I = 3x + 18$. Find x. 

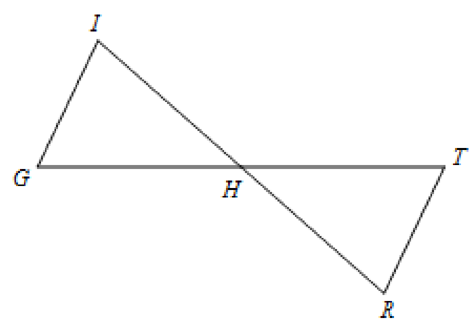
Watch the application walk through video if you need extra help getting started!

In order to prove that two triangles are congruent, you must show that every corresponding angle and every corresponding side is congruent.

3. Mark the picture and then prove it. Show ALL SIDES and ALL ANGLES $\cong$!!!

Given: $\boldsymbol{\overline{GI} \parallel \overline{TR}}$
$\boldsymbol{H}$ is the midpoint of $\boldsymbol{\overline{GT}}$
$\boldsymbol{\overline{GI} \cong \overline{RT}}$
$\boldsymbol{\overline{HR} \cong \overline{IH}}$

Prove: $\boldsymbol{\Delta GHI \cong \Delta THR}$

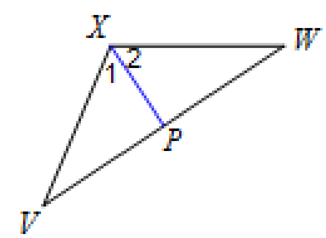


STATEMENTS	REASONS
1. $\overline{GI} \parallel \overline{TR}$ H is the midpoint of $\overline{GT}$ $\overline{GI} \cong \overline{RT}$ $\overline{HR} \cong \overline{IH}$	1.
2. $\overline{GH} \cong \overline{HT}$	2.
3. $\angle G \cong \angle T$	3. Alternate Interior Angles are congruent
4. $\angle I \cong \angle R$	4.
5.	5.
6. $\Delta GHI \cong \Delta THR$	6. Definition of Congruent Triangles

4. Mark the picture and then prove it. Show ALL SIDES and ALL ANGLES ≅ !!!

Given: ΔVXW **is an isosceles triangle with base** $\overline{VW}$
$\overline{XP}$ **is an angle bisector of** $\angle VXW$
P **is the midpoint of** $\overline{VW}$
$\angle VPX \cong \angle WPX$

Prove: $\Delta PVX \cong \Delta PWX$

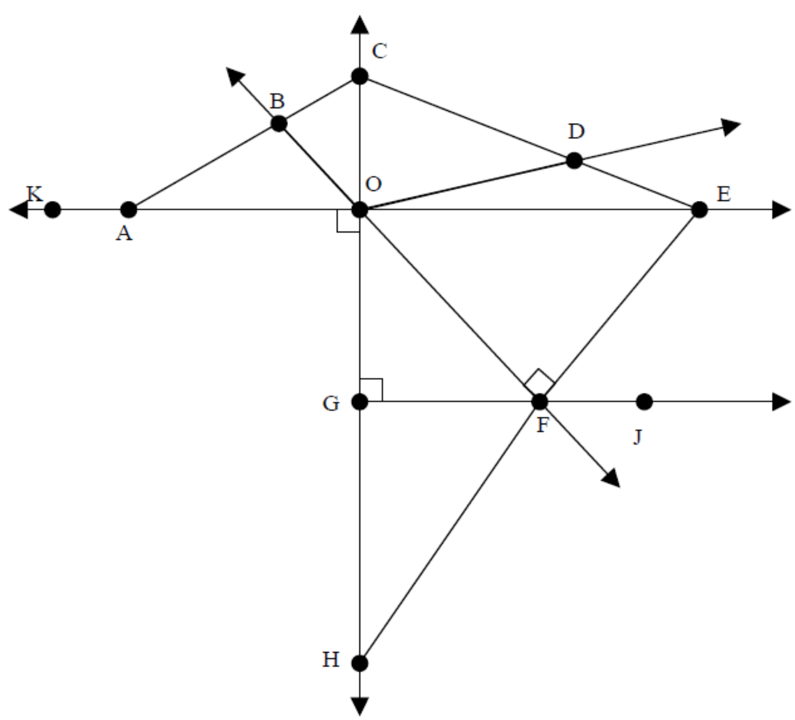


STATEMENTS	REASONS
1. ΔVXW is an isosceles triangle $\overline{XP}$ is an angle bisector of $\angle VXW$ P is the midpoint of $\overline{VW}$ $\angle VPX \cong \angle WPX$	1.
2. $\overline{XP} \cong \overline{XP}$	2.
3. $\overline{VX} \cong \overline{XW}$	3.
4.	4.
5. $\angle VXP \cong \angle WXP$	5.
6. $\angle XVP \cong \angle XWP$	6.
7. $\Delta PVX \cong \Delta PWX$	7.

5. Fill in the measure of every angle:

GIVEN:

$m\angle \text{KAB} = 148°$
$m\angle \text{EOF} = 45°$
$m\angle \text{DEF} = 65°$
$m\angle \text{ODE} = 145°$
$m\angle \text{JFH} = 122°$



Name any isosceles triangles.