Name:_____Per:___

GEO- Unit 4 – Congruent Triangles NOTES

Day 1 – Triangles Basics

Objectives: SWBAT classify triangles by their sides and angles.

Naming Triangles:

Equilateral Triangle:

Isosceles Triangle:

Scalene Triangle:

SIDES

Equiangular Triangle:

Acute Triangle:

Right Triangle:

Obtuse Triangle:

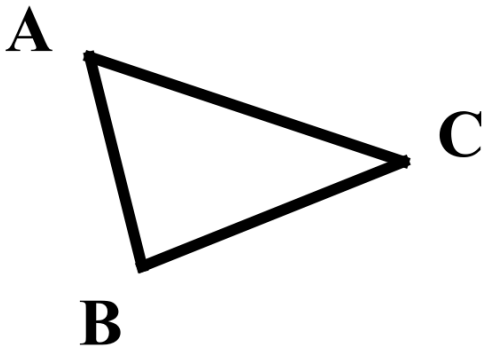
ANGLES

Parts of a Triangle

Vertex

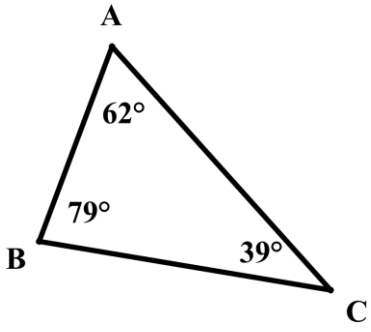
Side

Angle **Written**

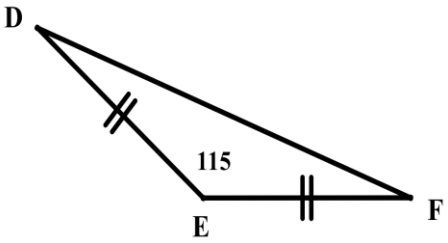


Classify each triangle by its angles and its sides (Hint: Has more than one name).

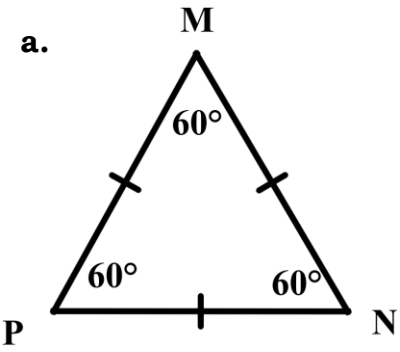
1.



2.



a.



Draw the following Triangles (if possible).

3. Right Isosceles

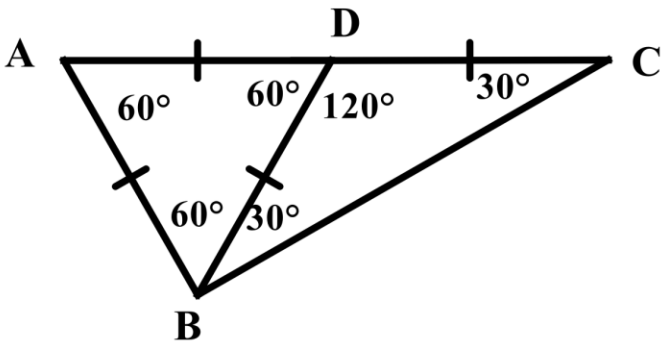
4. Obtuse Scalene

b. Acute Equilateral

5. Equilateral Scalene

c. Acute Obtuse Triangle

Given the following diagram: classify the following triangles.



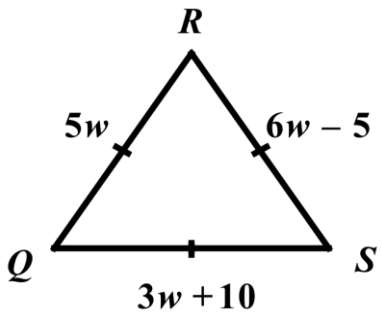
6. ΔABD

7. ΔBDC

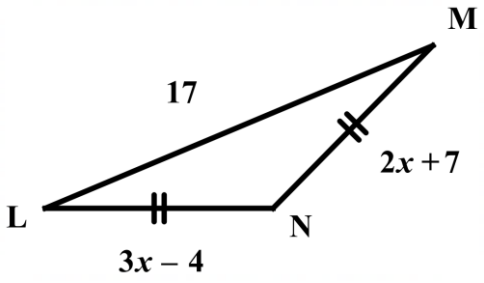
d) ΔABC

Find x and the unknown measure of the given triangles.

8.



e.



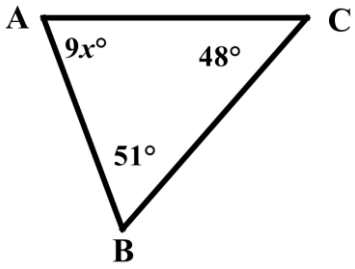
Day 2 – Triangles and their Angles

Objectives: SWBAT examine and find the measure of internal angles of a Triangle

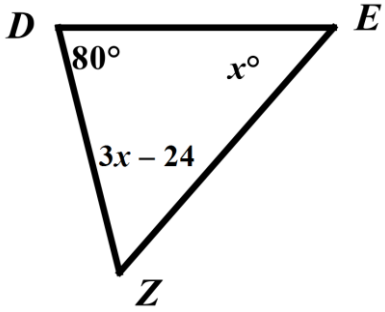
Triangle Sum Theorem

Solve for the variable.

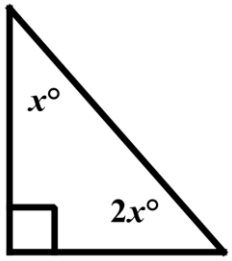
1.



2.



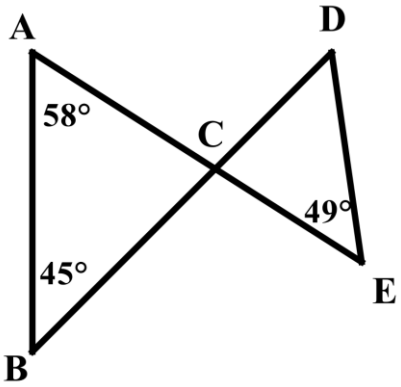
a.



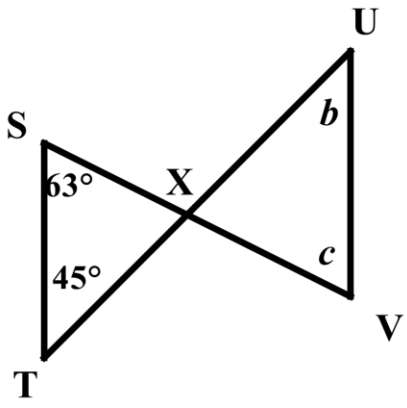
Find the following angle measures.

3. $M\angle ACB$

b. $M\angle CDE$



4. Given $\overline{ST}||\overline{UV}$, **Find *b* and *c***



Find the measure of each angle of the following triangles.DRAW THE TRIANGLES.

5. $m\angle A = x°$, $m\angle B = (x+30)°$, $m\angle C = (x+60)°$

6. $m\angle E = (6x+11)°$, $m\angle D = (3x+2)°$, $m\angle F = (5x-1)°$

7. $m\angle R = 90°$, $m\angle S = (2x+2)°$, $m\angle T = (3x+3)°$

Day 3 – Triangles and their Angles – External Angle Theorem

Objectives: SWBAT examine and find the measure of internal and exterior angles of a Triangle

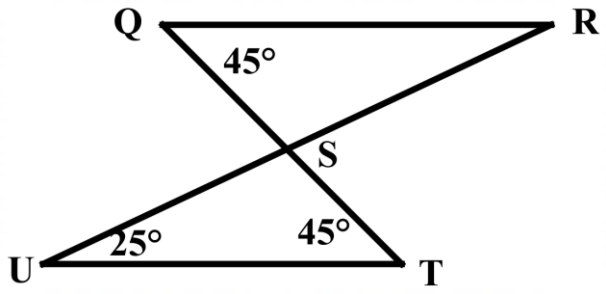
Triangle Sum Theorem

Find the following angle measures.

1. $m\angle TSU$

2. $m\angle QSR$

3. $m\angle R$



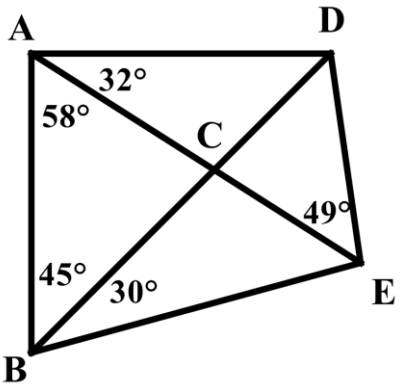
Find the following angle measures.

4. $m\angle ACB$

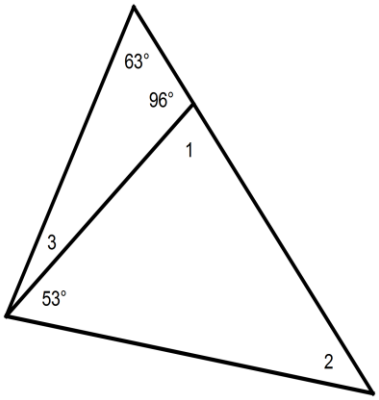
5. $m\angle CEB$

6. $m\angle CDE$

7. $m\angle ADC$



Find the following angle measures.

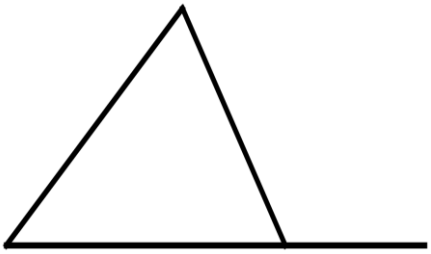


a. $m\angle 3$

b. $m\angle 1$

c. $m\angle 2$

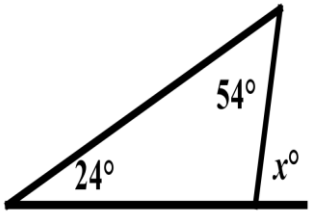
External Angle Theorem



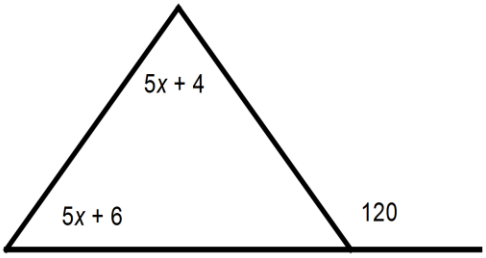
Remote Interior Angle

Solve for the following variables

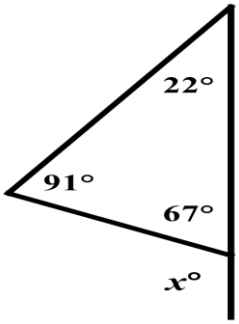
8.



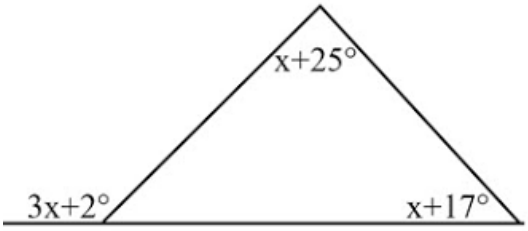
9.



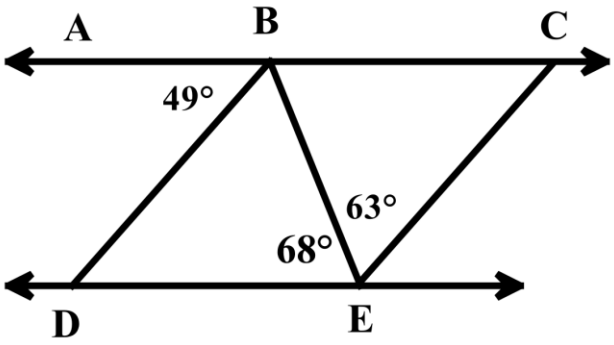
10.



d.



11. Find the following given that $\overline{AC}||\overline{DE}$



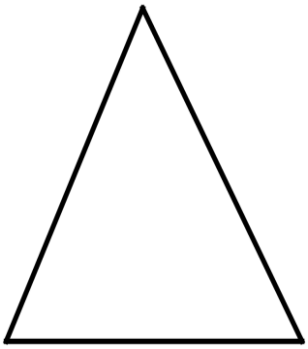
$m\angle DBE =$

$m\angle BCE =$

Day 4 – Isosceles and Equilateral Triangles

Objectives: SWBAT Use properties of isosceles and equilateral triangles.

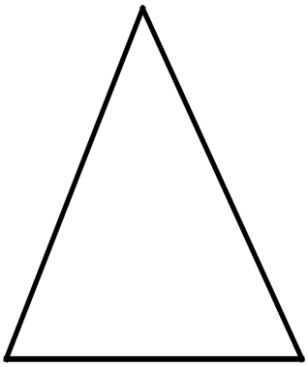
Isosceles Triangles



Legs **Vertex Angles**

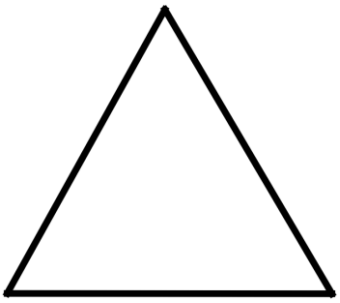
Base **Base Angles**

Base Angles Theorem~



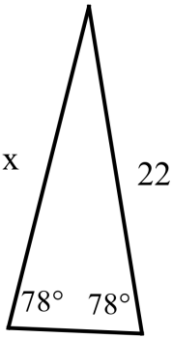
Base Angles Theorem Converse~

Equilateral Triangles

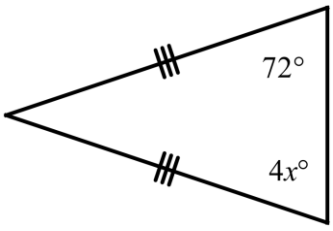


Find the value for the variable(s).

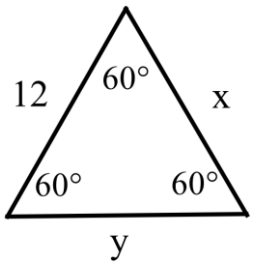
1.



2.

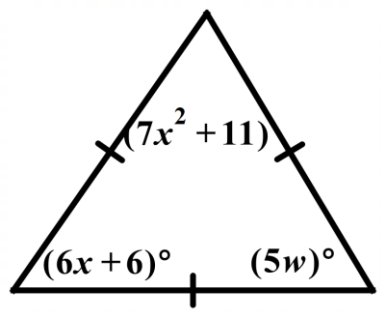


a.

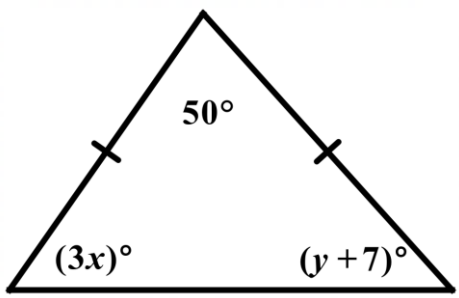


Find all the variables.

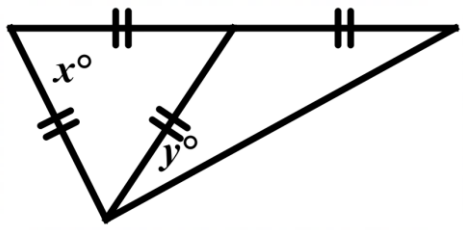
3.



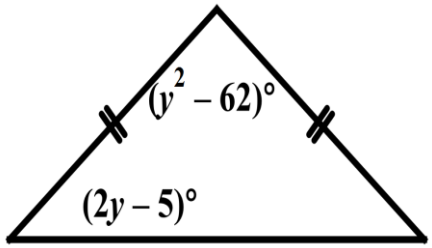
4.



b.



5.



c. Find all the variables

$v =$ _____

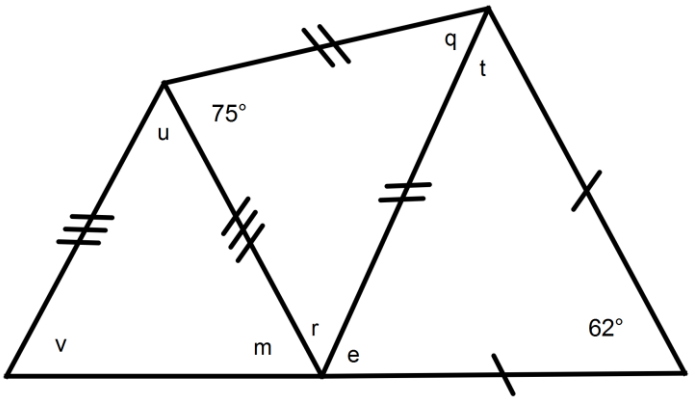
$u =$ _____

$r =$ _____

$t =$ _____

$e =$ _____

$q =$ _____



Day 5 – Congruence and Triangles

Objectives: SWBAT Identify congruent figures and corresponding parts.
SWBAT prove that two triangles are congruent.

Congruent Triangles

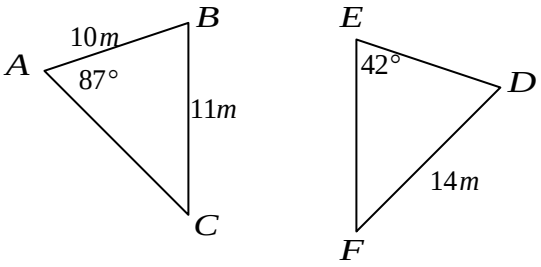
Corresponding Angles:

$$\Delta ABC \cong \Delta PQR$$

Corresponding Sides:

Given ΔABC $\cong$ ΔDEF, find the values of all angles and sides.

1.

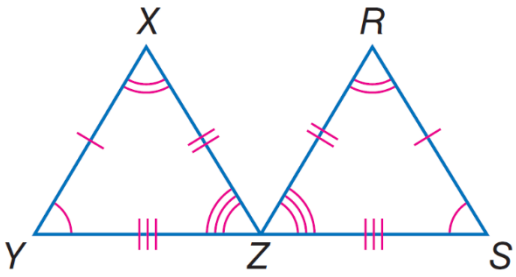


$\angle A =$ $\overline{AB} =$ $\angle D =$ $\overline{DE} =$

$\angle B =$ $\overline{BC} =$ $\angle E =$ $\overline{EF} =$

$\angle C =$ $\overline{AC} =$ $\angle F =$ $\overline{DF} =$

a.

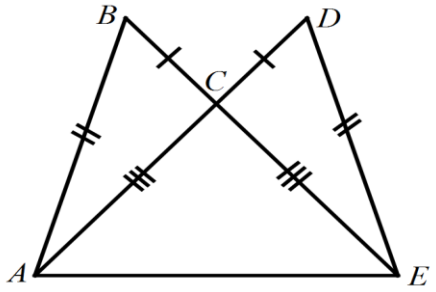


$SR =$ _____ $\angle R =$ _____

$SZ =$ _____ $\angle S =$ _____ $\Delta YXZ \cong$ _____

$RZ =$ _____ $\angle Z =$ _____

2. Refer to the figure below to complete the congruence statement.



$\Delta ABC \cong$ _____

b. If $\Delta MNO \cong PQR$, which of the following statements are true (**mark all the apply**).

a) $\overline{MN} \cong \overline{PQ}$ b) $\overline{MO} \cong \overline{PR}$

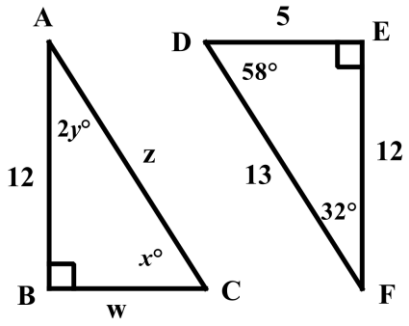
c) $\overline{NO} \cong \overline{RQ}$ d) $\overline{NO} \cong \overline{PQ}$

e) $\angle M \cong \angle P$ f) $\angle NOM \cong \angle QRP$

g) $\angle N \cong \angle Q$ h) $\angle ONM \cong \angle QRP$

Given the following information, find the variables.

5. $\Delta ABC \cong \Delta FED$



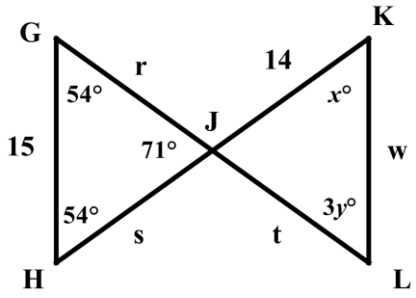
$w =$ _____

$x =$ _____

$y =$ _____

$z =$ _____

6. $\Delta GJH \cong \Delta KJL$



$r =$ _____

$s =$ _____

$t =$ _____

$w =$ _____

$x =$ _____

$y =$ _____

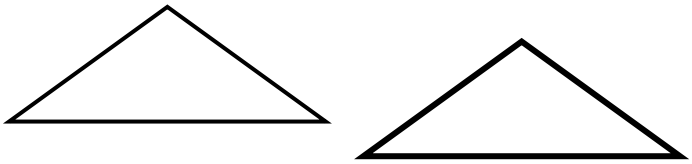
Day 6 - Proving Triangles are Congruent by SSS & SAS

Objectives: SWBAT prove triangles congruent using SSS & SAS

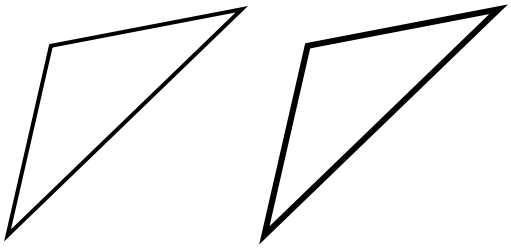
Proving Triangle are Congruent Shortcuts

Side – Side - Side

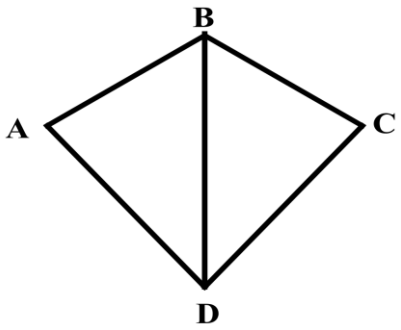
Side – Angle (included) - Side



NO @$$ IN CLASS!!!!!



Reflexive Property



EXAMPLES:

Draw a picture and write a congruency statement for the following.

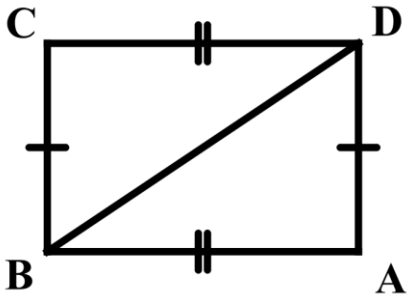
1. $\overline{AC} \cong \overline{NO}, \overline{CL} \cong \overline{OP}, \angle C \cong \angle O$

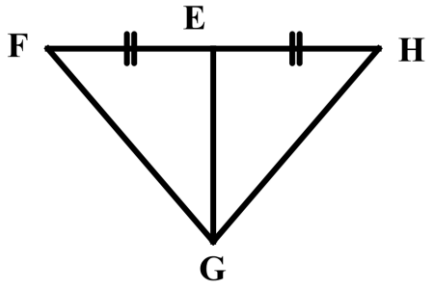
2. $\overline{WX} \cong \overline{AB}, \overline{XZ} \cong \overline{BC}, \overline{WZ} \cong \overline{AC}$

3. $\overline{EG} \cong \overline{PS}, \overline{EH} \cong \overline{PT}, \angle E \cong \angle P$

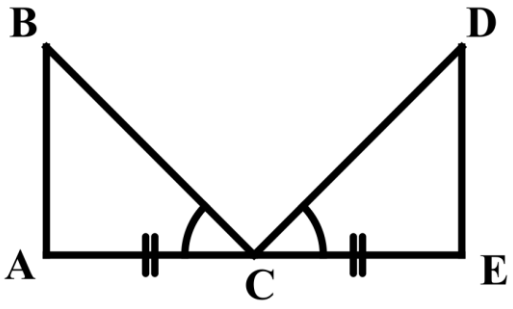
Examples: Determine if the following Triangles are congruent and if so why? If not why?

*******SIMPLY PUTTING SSS AND SAS IS NOT SUFFICIENT*******

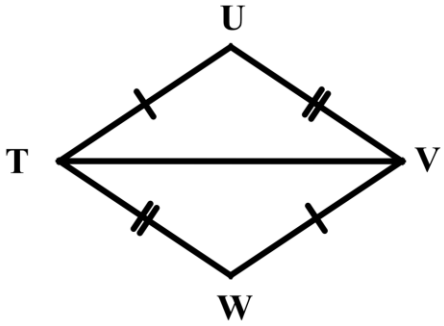




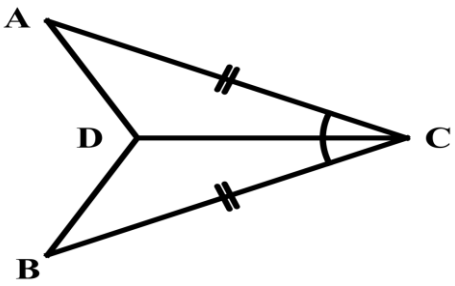
Ex III



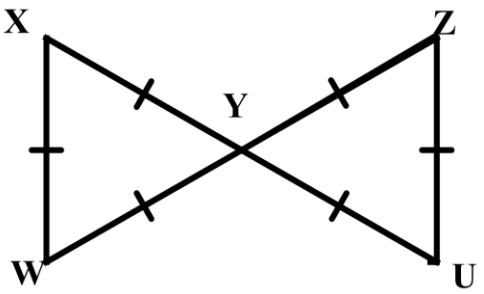
Ex IV



Ex V



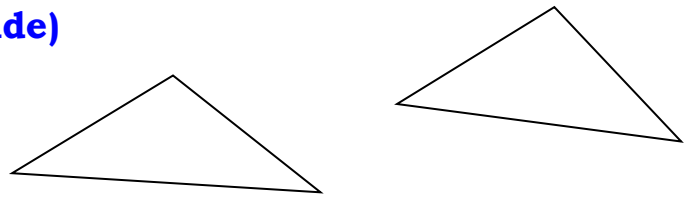
Ex VI



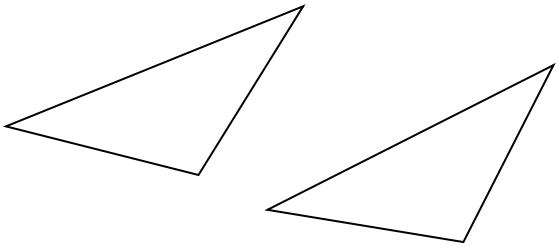
Day 7 - Proving Triangles are Congruent by ASA & AAS

Objectives: SWBAT prove triangles congruent using ASA & AAS

Angle – Angle – Side (not included side)



Angle – Side (included) - Angle



Examples:

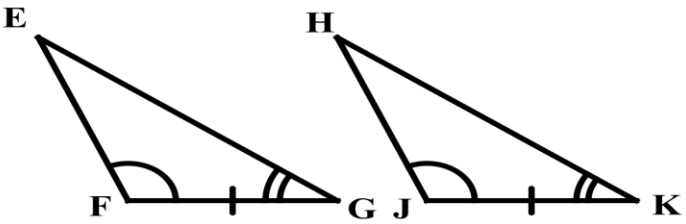
Draw a picture and write a congruency statement for the following.

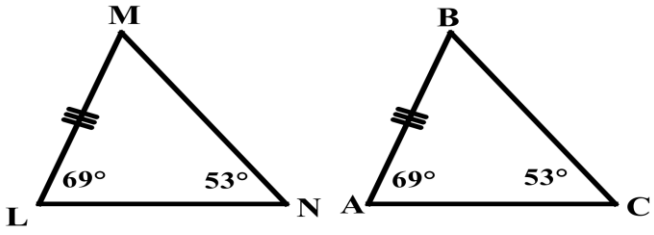
1. In $\triangle ABC$ and $\triangle ZXR$, $\angle C \cong \angle X$, $\angle A \cong \angle Z$, and $\overline{AB} \cong \overline{ZR}$.

2. In $\triangle DEF$ and $\triangle BGO$, $\angle D \cong \angle B$, $\angle E \cong \angle O$, and $\overline{DE} \cong \overline{BO}$.

Examples: Determine if the following Triangles are congruent and if so why? If not why?

*******SIMPLY PUTTING ASA AND AAS IS NOT SUFFICIENT*******





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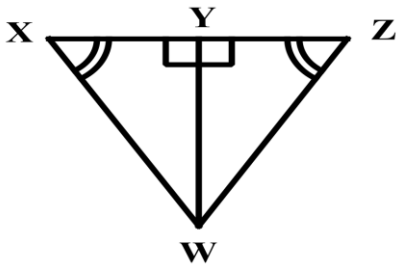
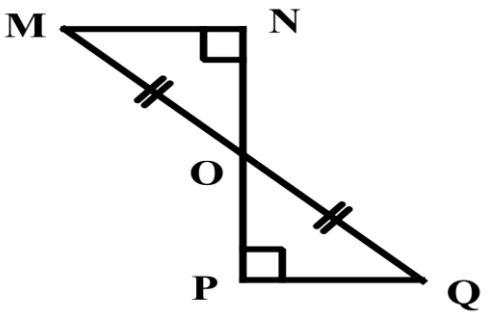
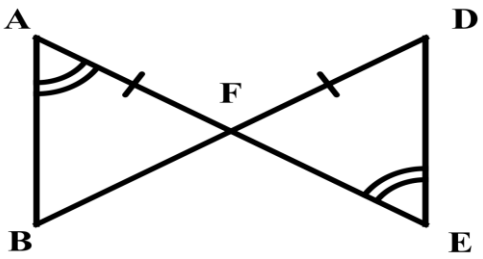
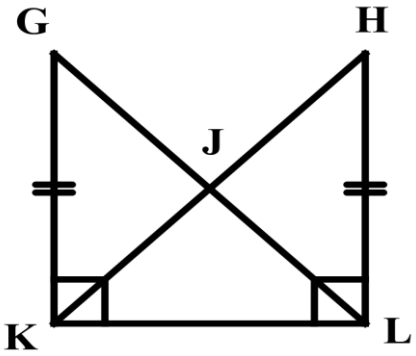
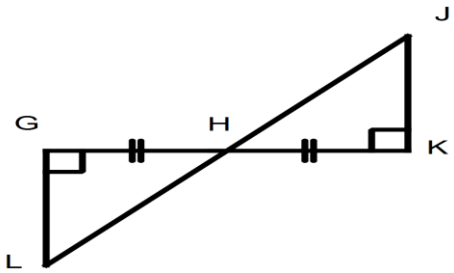
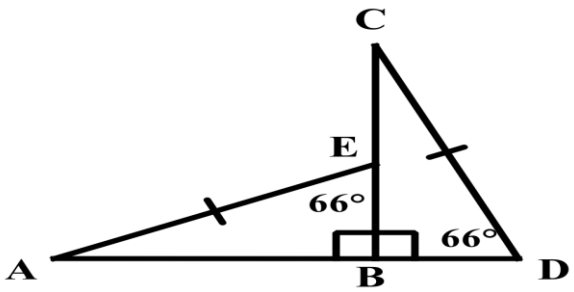








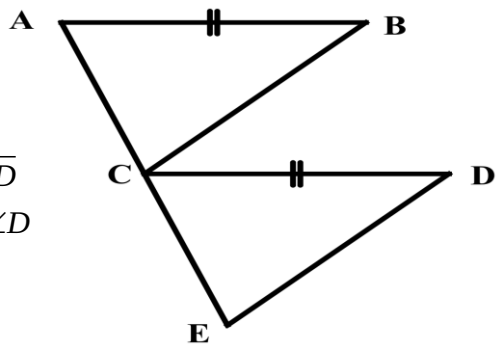




Given:

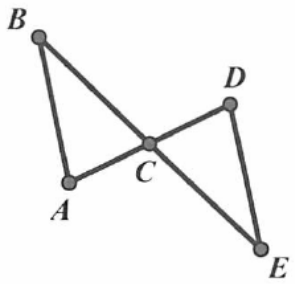
$\overline{AB} \parallel \overline{CD}$

$\angle B \cong \angle D$



3. Given $\overline{AB} \cong \overline{DE}$ and $\overline{AB} \parallel \overline{DE}$, which triangle congruence can be used to show $\Delta ABC \cong \Delta DEC$? Choose **all** that apply.

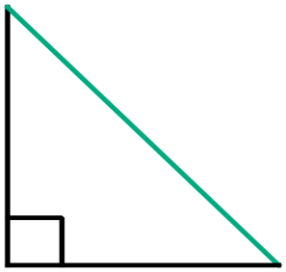
A. SAS
B. AAS
C. ASA
D. HL
E. None



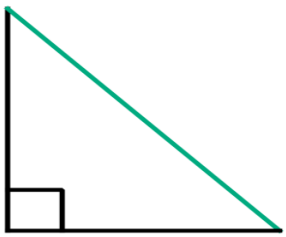
Day 8 – Proving Triangles are Congruent by HL

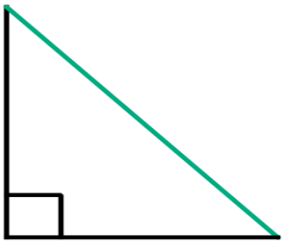
Objectives: SWBAT prove triangles congruent using HL

Review of a Right Triangle:



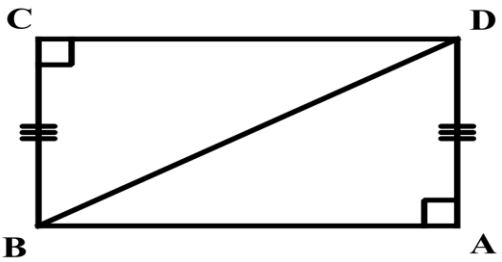
Hypotenuse Leg – HL-

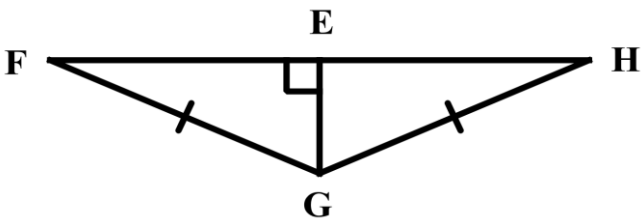




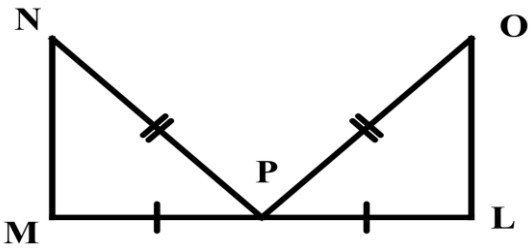
Determine if the following Triangles are congruent and if so why? If not why?

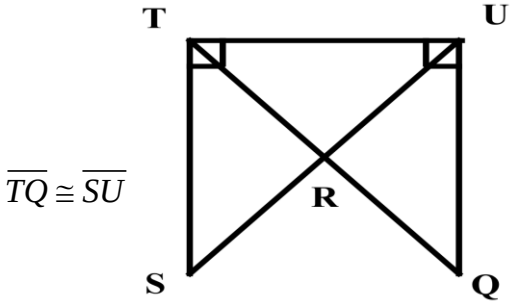
*******SIMPLY PUTTING HL IS NOT SUFFICIENT*******



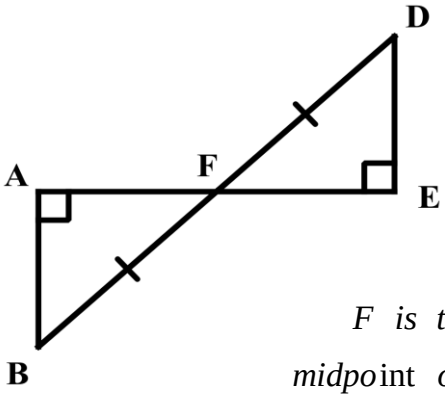


_____ _____
_____ _____
_____ _____

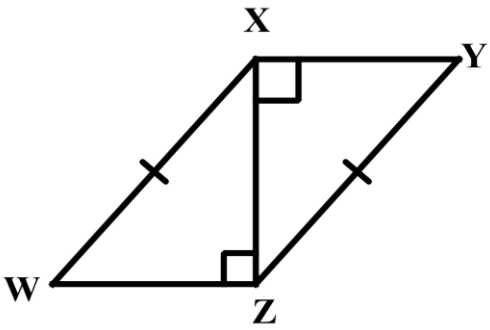




$\overline{TQ} \cong \overline{SU}$



F is the midpoint of $\overline{AE}$



Day 9 – Using Congruent Triangles

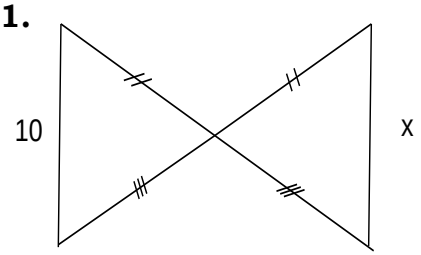
Objectives: SWBAT Use congruent triangles to find other information about those triangles

What are the different triangle theorems we have learned so far? LIST THEM!

Corresponding Parts of Congruent Triangles are Congruent (CPCTC)

Tell how the following Triangles are congruent. Then, find the missing variable.

1.

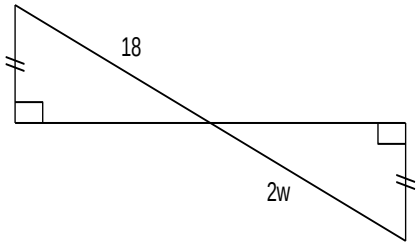


Triangles are Congruent because

_____

Solve for x

2.

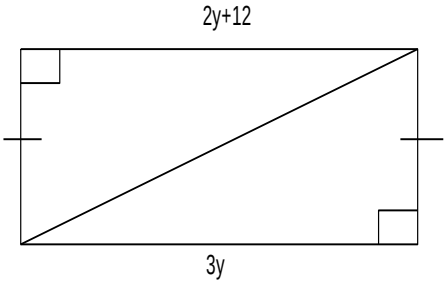


Triangles are Congruent because

_____

Solve for w

3.

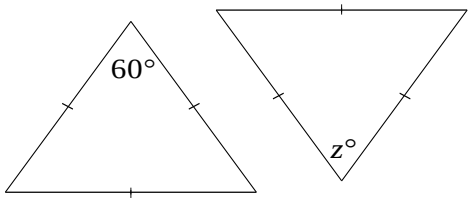


Triangles are Congruent because

_____

Solve for y

4.

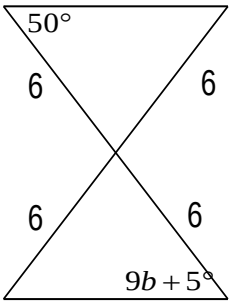


Triangles are Congruent because

_____

Solve for z

5.

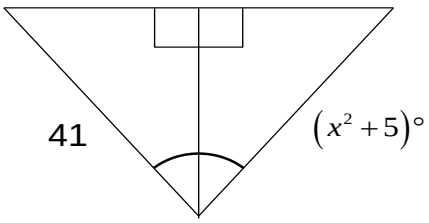


Triangles are Congruent because

_____

Solve for b

6.



Triangles are Congruent because

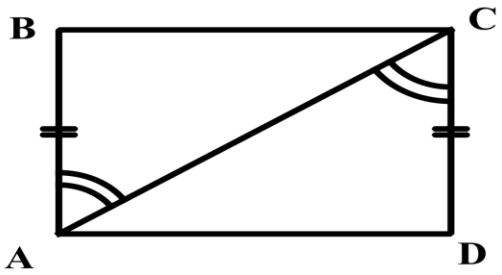
_____

Solve for x

Write a congruency statement proving the following statements.

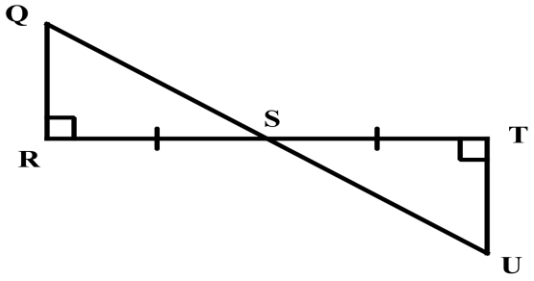
7. Given: Diagram

Prove: $\overline{BC} \cong \overline{AD}$



8. Given: Diagram

Prove: $\angle Q \cong \angle U$



9.

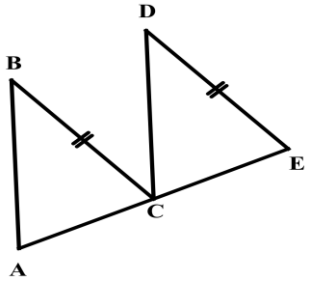
Given:

$\overline{AB} \parallel \overline{CD}$

$\angle B \cong \angle D$

Prove:

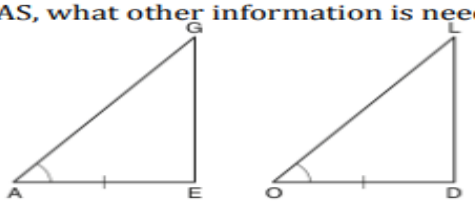
$\overline{AC} \cong \overline{CE}$



MULTIPLE CHOICE PRACTICE

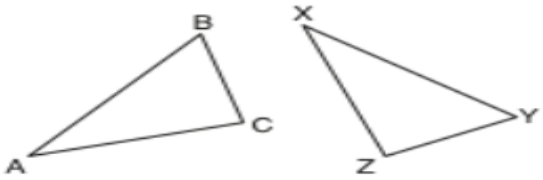
1. In the diagram below of ΔAGE and ΔOLD, $\angle GAE \cong \angle LOD$ and $AE \cong OD$. To prove that ΔAGE ≅ ΔOLD by SAS, what other information is needed?

(1) $GE \cong LD$
(2) $AG \cong OL$
(3) $\angle AGE \cong \angle OLD$
(4) $\angle AEG \cong \angle ODL$



2. Which statements could be used to prove that ΔABC and ΔXYZ are congruent?

(1) $\overline{AB} \cong \overline{XY}$, $\overline{BC} \cong \overline{YZ}$, and $\angle A \cong \angle X$
(2) $\overline{AB} \cong \overline{XY}$, $\angle A \cong \angle X$, and $\angle C \cong \angle Z$
(3) $\angle A \cong \angle X$, $\angle B \cong \angle Y$, and $\angle C \cong \angle Z$
(4) $\angle A \cong \angle X$, $\overline{AC} \cong \overline{XZ}$, and $\overline{BC} \cong \overline{YZ}$



3. In the accompanying diagram, $\overline{EC} \cong \overline{FA}$ and $\overline{EC} \parallel \overline{FA}$. Triangle EGC can be proved congruent to triangle FGA by

(1) HL
(2) AAA
(3) AAS
(4) SSA