Name _____ **GEOMETRY**

UNIT 2 NOTE PACKET

Triangle Proofs

Date	Page	Topic	Homework
9/19	2-3	Vocabulary	Study Vocab
9/20	4	Vocab Cont. and Reflexive/Addition/Subtraction	No Homework
9/23	5-6	Drawing Conclusions from Vocab	Worksheet Drawing conclusions from Vocab
9/24	7	Mini Vocab Proofs	No Homework
9/25	8-9	QUIZ Deciphering SAS, ASA, SSS, AAS, HL	Worksheet SSS,SAS,ASA and AAS Congruence
9/26	10	Proving Triangles Congruent	Geometry Practice GG28#1
9/27	11	Proving Triangles Congruent Continued	Proof Homework Worksheet
9/30	12-13	CPCTC	CPCTC Homework Worksheet
10/1	14	QUIZ Proofs W/Parallel and 2 pairs of triangles	No Homework
10/2	X	Proof Puzzles/ More Practice	Finish Proof Puzzles
10/3	15	Isosceles Triangle Proofs	No Homework
10/4	16	Overlapping Triangle Proofs	Geometry Practice Sheet
10/7	X	QUIZ Review	Finish Review Sheet
10/8	X	Review	Ticket In / Study
10/9	**X**	**TEST**	No Homework

VOCABULARY UNIT 2

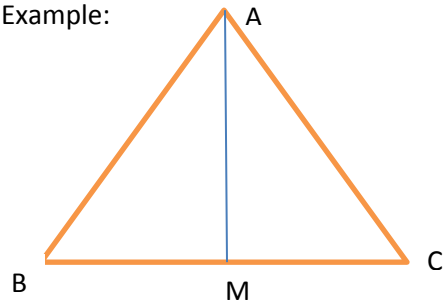
Term	Picture/ Example
Reflexive Property- a segment or an angle is congruent to itself. (a=a)	
Substitution Postulate- if two things are congruent to the same thing then they are congruent to each other. (If a=b and a=c then b=c)	
Addition Postulate- If you add the same thing to two equal things then the result is equal. (If a=b, then a+c=b+c)	
Subtraction Postulate- If you subtract the same thing from two equal things then the result is equal. (If a=b, then a-c=b-c)	
Segment Bisector- A line that intersects a segment and cuts it into two congruent parts.	
Angle Bisector- A line (or part of a line) that divides an angle into two congruent parts.	
Median- A segment that goes from the vertex of a triangle to the MIDPOINT of the opposite side.	
Altitude- A segment that goes from the vertex of a triangle and is PERPENDICULAR to the opposite side.	

Isosceles Triangle- A triangle with exactly two congruent sides and two congruent angles.	
Right Triangle- A triangle with a right angle.	
Equilateral Triangle- A triangle with three congruent sides and three congruent angles.	

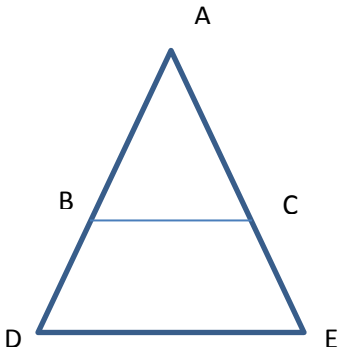
USING REFLEXIVE/ADDITION/SUBTRACTION

Reflexive property: Use REFLEXIVE when you have one part (side or angle) that is part of two triangles…

Example:



or

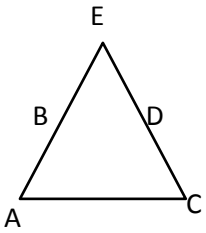


Addition postulate: _____

Example:

If AB≅CD and BE≅ DE

Then:



Subtraction postulate: _____

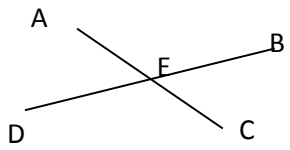
If AC≅BD

Show: AB≅CD

Drawing Conclusions From Vocabulary

Segment bisector:_____

Given: AC bisects BD at E



Conclusion: _____

Reason:_____

Using the same picture above

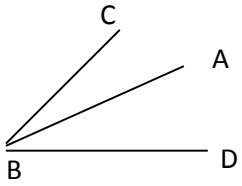
Given: AC and BD bisect each other at E then

Conclusion(s): _____

Reason:_____

Angle bisector:_____

Given: AB bisects <CBD

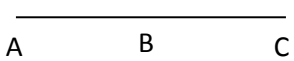


Conclusion: _____

Reason:_____

Midpoint:_____

Given: B is the midpoint of AC

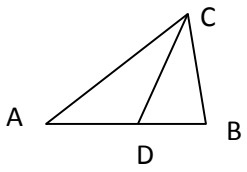


Conclusion: _____

Reason:_____

Median:_____

Given: Triangle ABC, with median CD

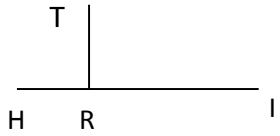


Conclusion: _____

Reason:_____

Perpendicular:_____

Given: HI ⊥TR

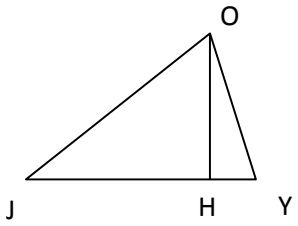


Conclusion: _____

Reason:_____

Altitude:_____

Given: triangle JOY with altitude OH



Conclusion: _____

Reason:_____

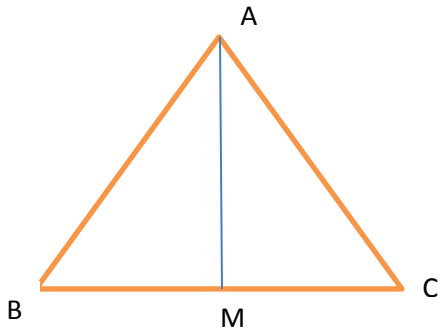
Median → _____ → _____

Altitude → _____ → _____ → _____

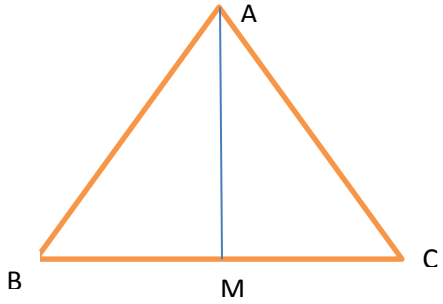
Intersecting lines → _____

MINI VOCABULARY PROOFS

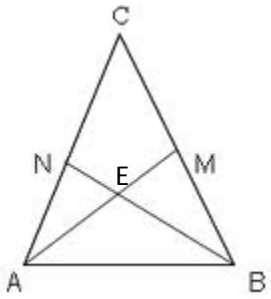
1.) Given: AM is the median in ΔABC
Prove: BM≅MC



2.) Given: AM is the Altitude in ΔABC
Prove: ∡BMA≅∡CMA

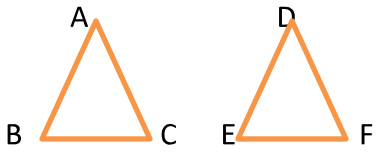
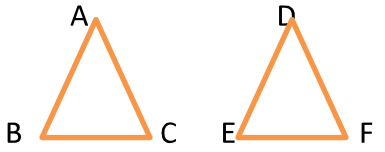
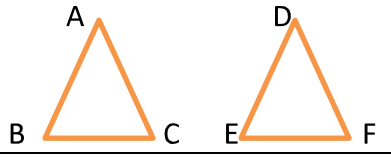
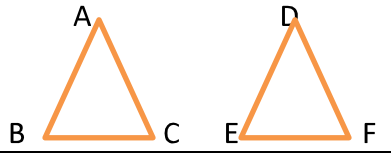
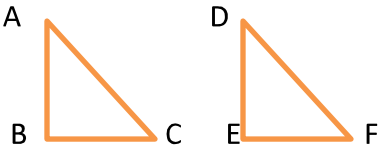


3.) Given: NB and AM intersect at E
Prove: AB≅AB and ∡NEA≅∡MEB



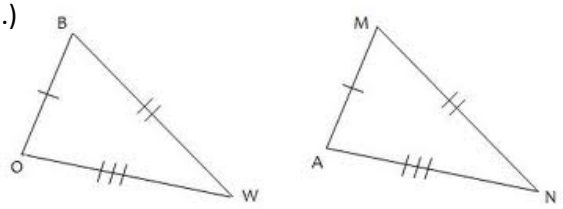
Deciphering SAS, ASA, SSS, AAS, HL

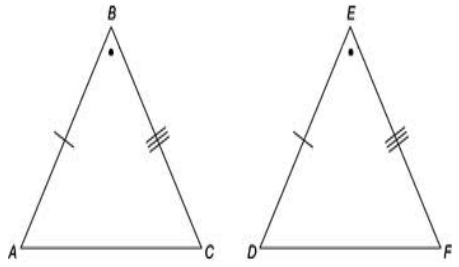
There are 5 ways to prove that triangles are congruent:

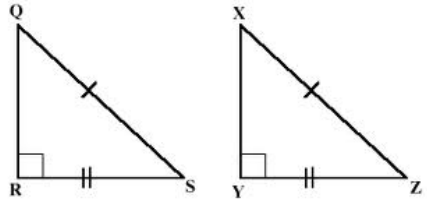
	PICTURE
SAS _____ _____ _____	
ASA_____ _____ _____	
SSS_____ _____ _____	
AAS _____ _____ _____ (or SAA)	
HL _____ _____ (Must be a right triangle)	

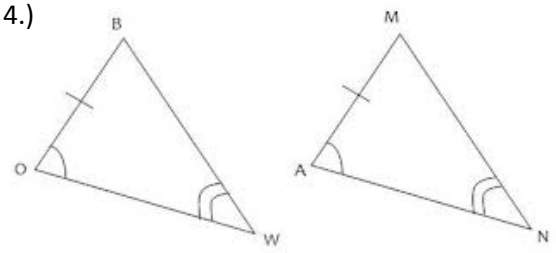
There are some combinations that don't work they are _____ and _____!

Write a congruence statement and tell which way you can tell that the triangles are congruent:

1.) 

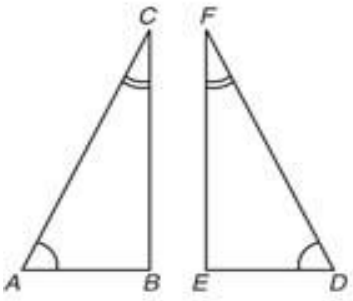
2.) 

3.) 

4.) 

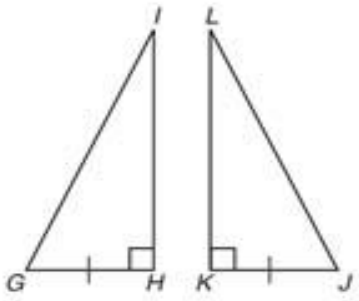
Name the additional part(s) that you would have to get congruent in order to prove that the triangles are congruent the way stated.

$\triangle ABC \cong \triangle DEF$ by AAS



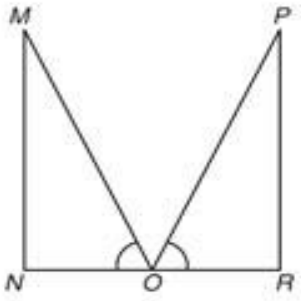
(a)

$\triangle GHI \cong \triangle JKL$ by HL



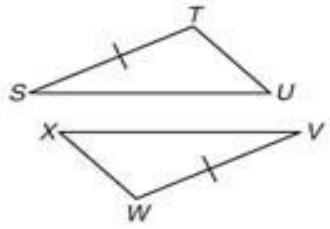
(b)

$\triangle MNO \cong \triangle PRO$ by SAS



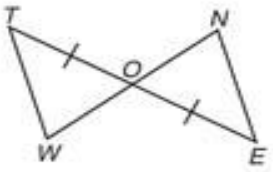
(c)

$\triangle STU \cong \triangle VWX$ by SSS



(d)

$\triangle ONE \cong \triangle OWT$ by ASA



(e)

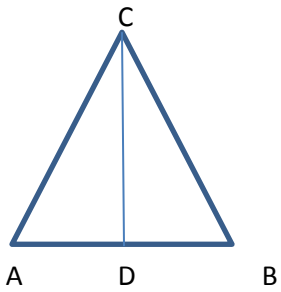
TRIANGLE PROOFS!

NOTICE~ All of the pictures are the same and we are trying to prove the same thing each time but we will use different methods based on the givens!

Make no assumptions, only draw conclusions from what you are given!

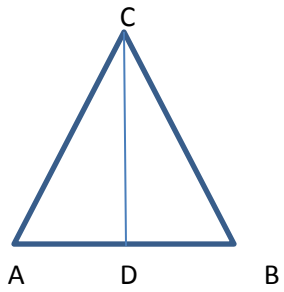
1.) Given: ΔABC with $AC \cong BC$
CD bisects $\angle ACB$

Prove: $\Delta ACD \cong \Delta BCD$



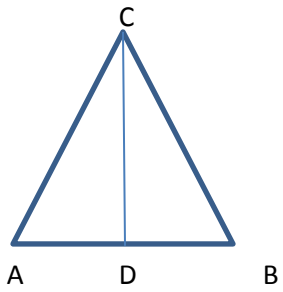
2.) Given: Isosceles triangle ABC with $CA \cong CB$
D is the midpoint of AB

Prove: $\Delta ACD \cong \Delta BCD$



3.) Given: Isosceles triangle ABC with $CA \cong CB$
CD is the Altitude to AB

Prove: $\Delta ACD \cong \Delta BCD$



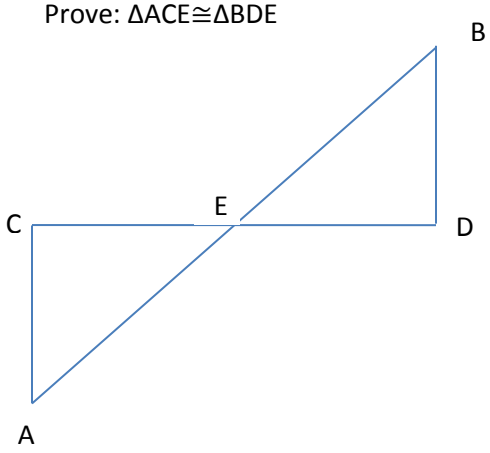
MORE TRIANGLE PROOFS!

1.)Given: BA bisects CD

AC⊥CD

BD⊥CD

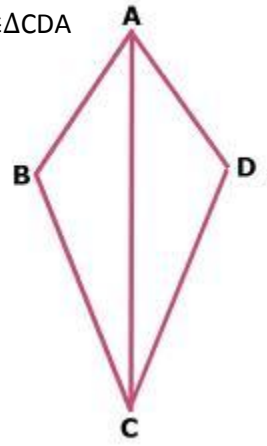
Prove: ΔACE≅ΔBDE



2.) Given: BA≅DA

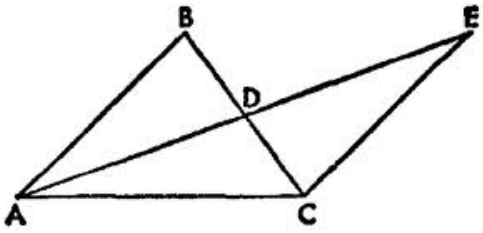
CA bisects ∡BAD

Prove: ΔCBA≅ΔCDA



3.) Given: BC and AE bisect each other at D

Prove: ΔABD≅ΔECD



CPCTC

C_____ **P**_____ of

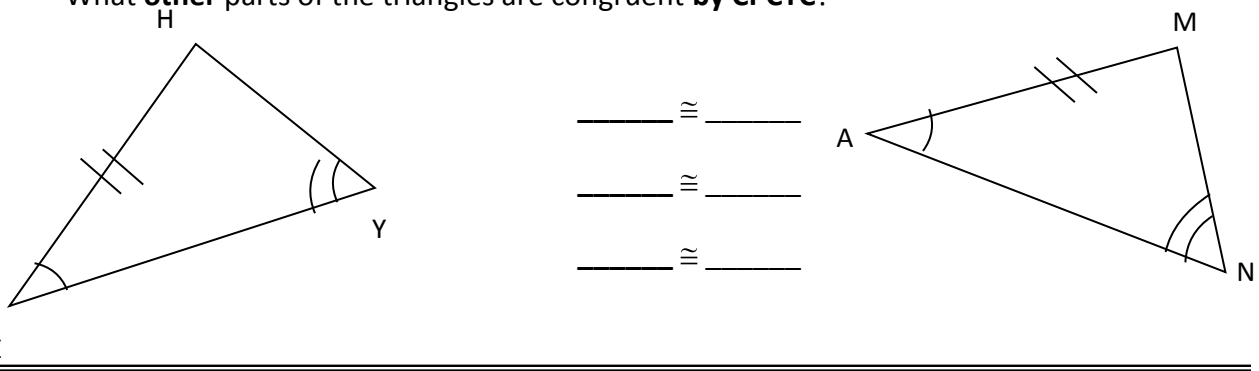
C_____ **T** _____ are **C**_____

You can use CPCTC AFTER you have proven two triangles are congruent to get that any additional parts are congruent!

Examples:

#1: ΔHEY is congruent to ΔMAN by _____.

What **other** parts of the triangles are congruent **by CPCTC**?

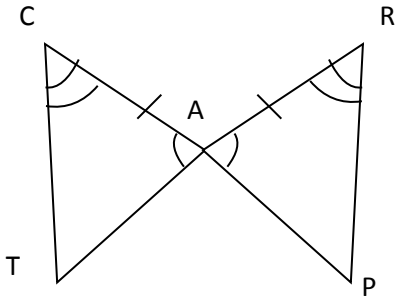


_____ ≅ _____

_____ ≅ _____

_____ ≅ _____

#2:



$\Delta CAT \cong$ _____, by _____

THEREFORE:

_____ ≅ _____, by CPCTC

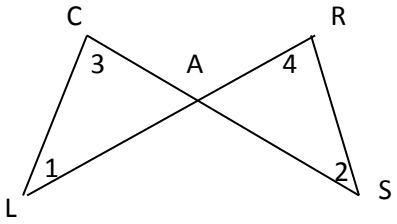
_____ ≅ _____, by CPCTC

_____ ≅ _____, by CPCTC

#3:

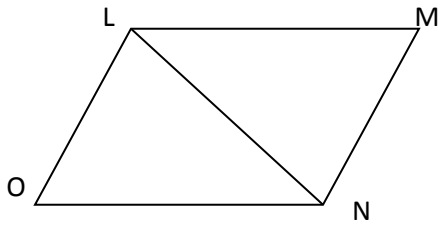
Given: $\overline{AC} \cong \overline{AR}$ and $\angle 1 \cong \angle 2$

Prove: $\angle 3 \cong \angle 4$

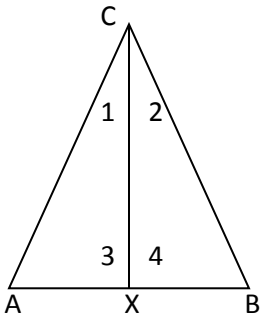


#4:

Given: $\angle NLM \cong \angle LNO$ and $\angle OLN \cong \angle MNL$
Prove: $\angle M \cong \angle O$

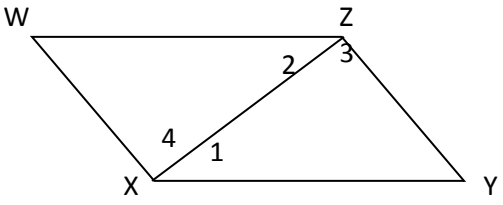


#5
Given: $\overline{AC} \cong \overline{BC}$ and $\overline{AX} \cong \overline{BX}$
Prove: $\angle 1 \cong \angle 2$



#6

Given: $\angle 1 \cong \angle 2$ and $\angle 3 \cong \angle 4$
Prove: $\overline{XY} \cong \overline{ZW}$



PROOFS WITH PARALLEL LINES AND

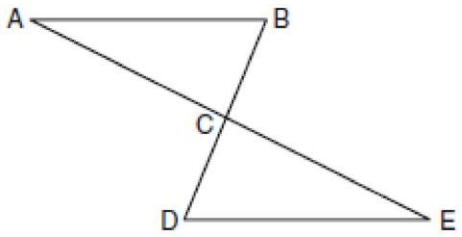
PROVING MORE THAN 1 PAIR OF TRIANGLES CONGRUENT

If you are given that two lines are parallel then you should always look for Alternate Interior Angles.

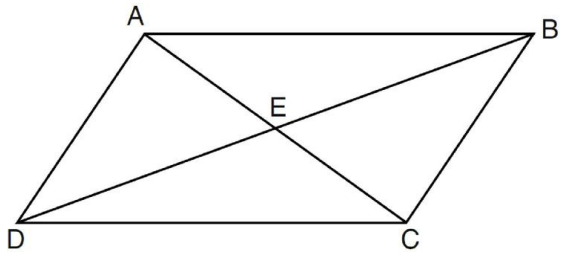
Draw Alternate interior angles:

Example:

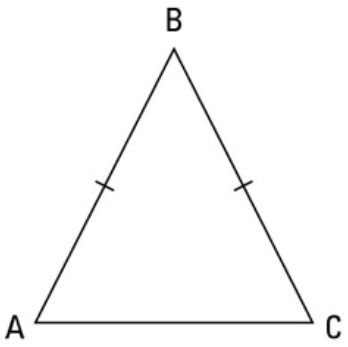
1.) Given: AE bisects BD
AB∥DE
Prove: AC≅EC



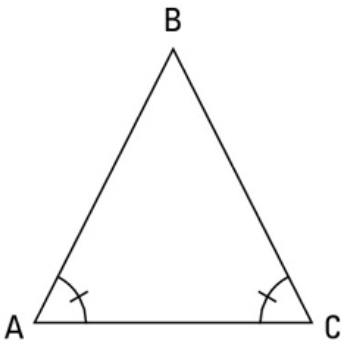
2.) Given: ∡ABE≅ ∡CDE
AB≅CD
Prove: AD≅CB



ISOSCELES TRIANGLE PROOFS



If you know this . . .



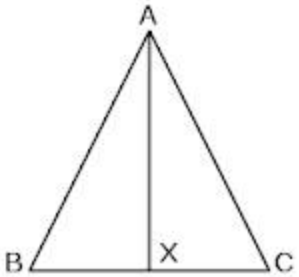
. . . you can conclude this.

Or you can do the opposite.

Examples:

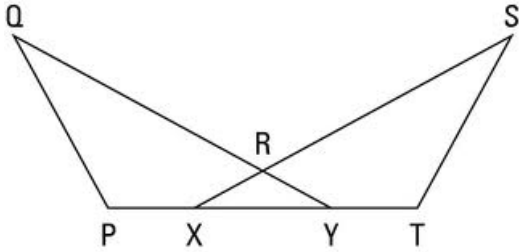
1.) Given: Triangle ABC is isosceles with AB≅AC
AX is a Median to BC

Prove: ∡BAX≅∡CAX



2.) Given: Triangle XRY is isosceles
PQ≅TS
∡Q≅∡S

Prove: QY ≅SX

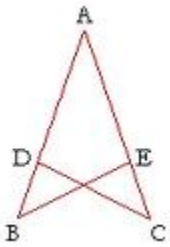


OVERLAPPING TRIANGLES PROOFS

When working with overlapping triangles, try to draw the triangles separately!

1.) Given: BE≅CD
∡BEA≅ ∡CDA

Prove: ∡B≅ ∡C



2.) Given: ∡1≅∡2
DA ⊥ AB
CB ⊥ AB
AE≅BF

Prove: DF≅CE