A MIND THAT IS **STRETCHED** BY A NEW EXPERIENCE CAN NEVER GO BACK TO ITS OLD DIMENSIONS.

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Warm Up 4.27.16
Milestones Question

Two polynomials are given below.

$P = 3x^2 + 2x - 6$

$Q = 2x^2 - 2x + 10$

Find P + Q and Q - P. Show your work.

Quizzes Back
Class Average: 80.1

Today's Learning Outcome
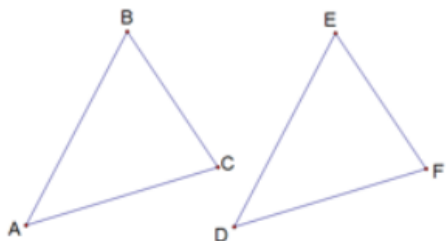Writing Proofs (yay!) for
Congruent Triangles

Kahoot!

Acc Algebra 1 **Triangle Congruence** Name _____

<u>Definition of Congruent Triangles</u>

Two triangles, $\triangle ABC$ and $\triangle DEF$ are congruent if:

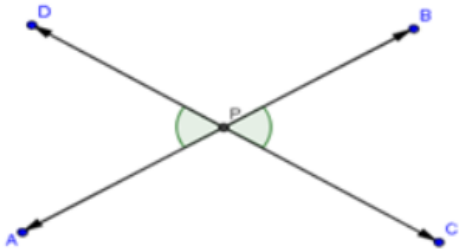1. All __*sides*__ are congruent.

2. All __*angles*__ are congruent.

-In order to prove triangles are congruent, there are several methods to use.

| *SSS*	*SAS*	*ASA*	*AAS*	*HL*
Three pairs of corresponding sides are congruent.	Two pairs of corresponding sides and their included angles are congruent.	Two pairs of corresponding angles and their included sides are congruent.	Two pairs of corresponding angles and the corresponding nonincluded sides are congruent.	In right triangles, pair of legs and the hypotenuses are congruent.

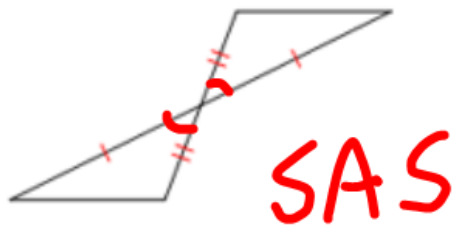# LOOK-FORS

You mark these yourself!
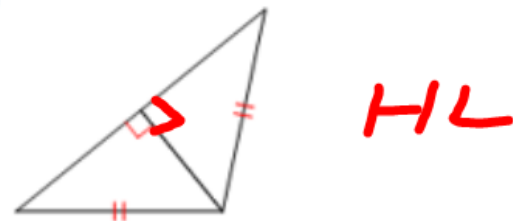
1) Vertical Angles

2) Shared Sides
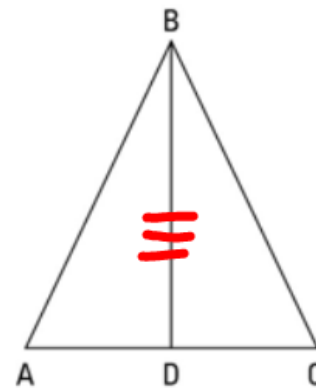
State if the following triangles are congruent. If they are congruent identify the congruence theorems used.
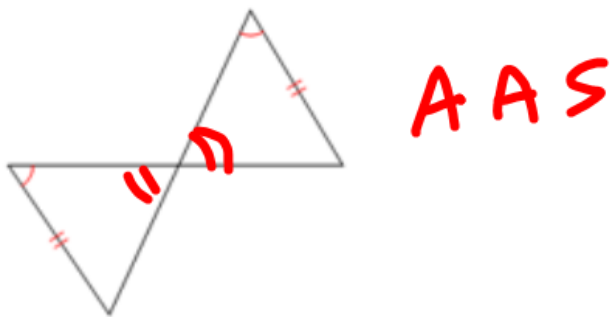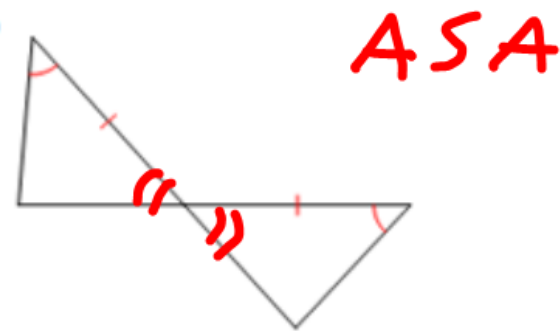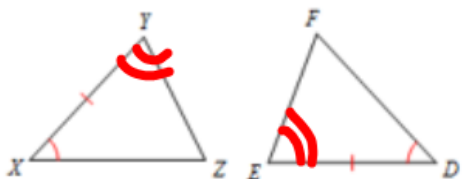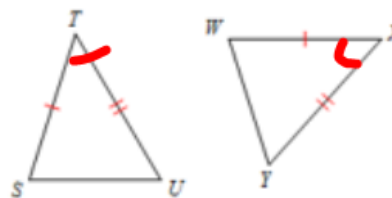
1)

SAS

2)

HL

3)

AAS

4)

ASA

State the additional information needed to use the given congruence theorem.

5) ASA

$\angle Y \cong \angle E$

6) SAS

$\angle T \cong \angle X$
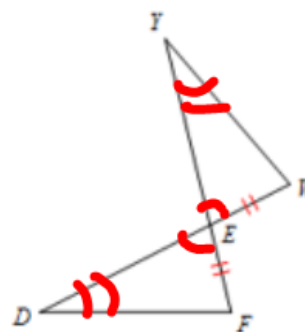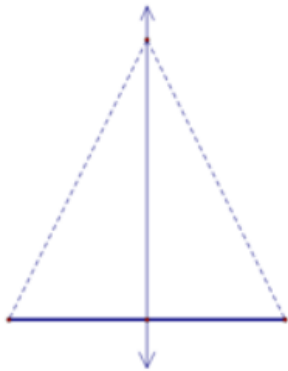
7) HL

$\overline{MT} \cong \overline{KM}$
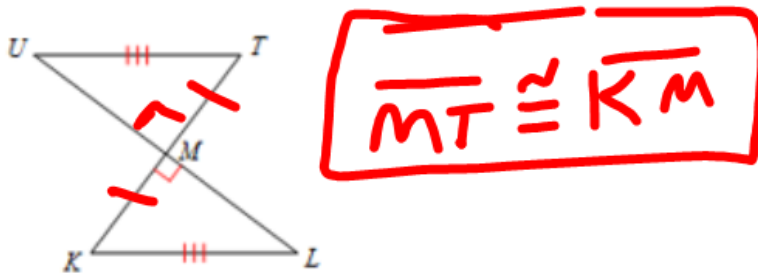
8) AAS

$\angle Y \cong \angle D$

Proofs involving Congruent Triangles

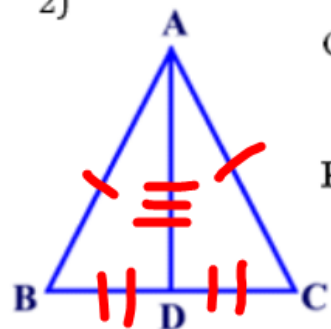1) A point on the perpendicular bisector of a line segment is equidistant from the endpoints of the line segment.
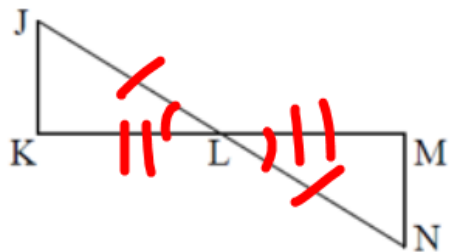
Given:

Prove:

2)

Given: $\overline{AB} \cong \overline{AC}$

$\overline{AD}$ bisects $\overline{BC}$

Prove: $\triangle ABD \cong \triangle ACD$

Statements	Reasons
1. $\overline{AB} \cong \overline{AC}$ $\overline{AD}$ bisects $\overline{BC}$	1. Given
2. $\overline{BD} \cong \overline{CD}$	2. Def. bisect
3. $\overline{AD} \cong \overline{AD}$	3. Reflexive Property
4. $\triangle ABD \cong \triangle ACD$	4. SSS

3)

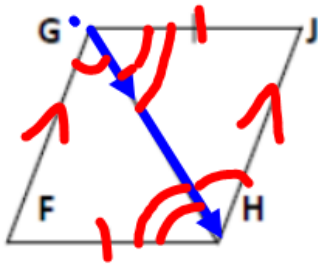Given: $\overline{JN}$ and $\overline{KM}$ bisect each other

Prove: $\triangle JKL \cong \triangle NML$

Prove: $\overline{JK} \cong \overline{NM}$

Statements	Reasons
1. $\overline{JN}$ +$\overline{KM}$ bi.e.o.	1. Given
2. $\overline{JL} \cong \overline{NL}$ $\overline{KL} \cong \overline{ML}$	2. Def. of bisect
3. $\angle MLN \cong \angle KLJ$	3. Vert. $\angle$'s $\cong$
4. $\triangle JKL \cong \triangle NML$	4. SAS
5. $\overline{JK} \cong \overline{NM}$	5. CPCTC

Corresponding parts of congruent triangles congruent

4) Given: $JG \cong FH$ and $GF // HJ$

Prove: $\triangle JGH \cong \triangle FHG$

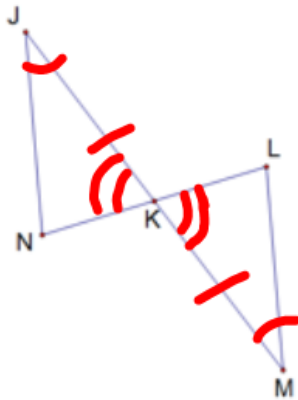| Statements	Reasons
1. $\overline{JG} \cong \overline{FH}$ $GF \parallel HJ$	1. Given.
2. $\angle FGH \cong \angle JHG$ $\angle JGH \cong \angle FHG$	2. Alt. Int $\angle$'s
3. $\triangle JGH \cong \triangle FHG$	3. A A S

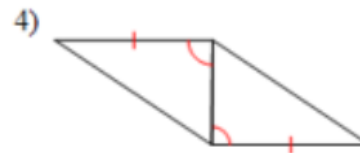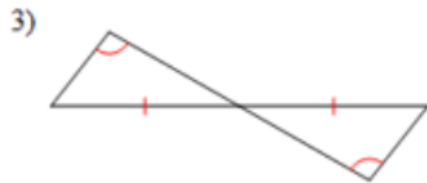5) Given: K is the midpoint of JM
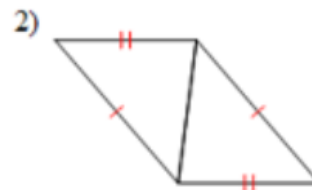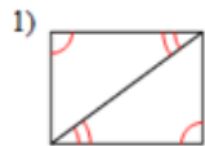
$\angle J \cong \angle M$

Prove: $\triangle NKJ \cong \triangle LKM$

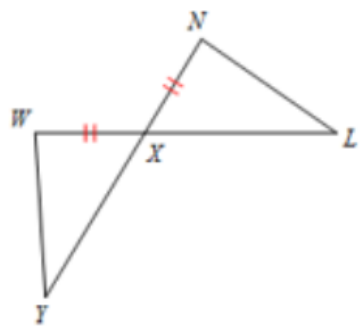| Statements	Reasons
1. K mp. of $\overline{JM}$ $\angle J \cong \angle M$	Given
2. $\overline{JK} \cong \overline{KM}$	2. Def. of mp.
3. $\angle JKN \cong \angle MKL$	3. Vert. $\angle$'s $\cong$
4. $\triangle NKJ \cong \triangle LKM$	4. ASA

Triangle Congruence Proofs

State if the two triangles are congruent. If they are, state how you know.
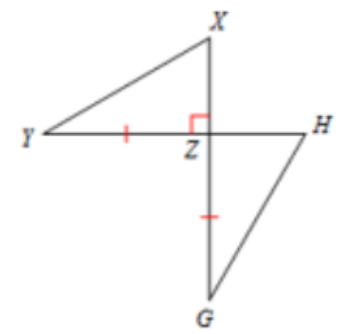
1)

2)

3)

4)

State what additional information is required in order to know that the triangles are congruent for the reason given.
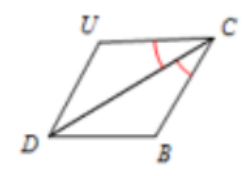
5) ASA

6) HL

7) SAS
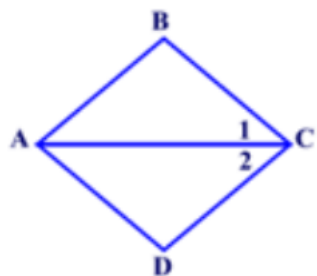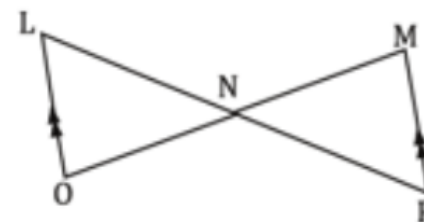
8) ASA

Write two column proofs for the following situations.

9. Given: $\overline{BC} \cong \overline{CD}$

         $\overline{AC}$ bisects $\angle BCD$
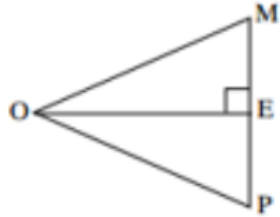
Prove: $\triangle ABC \cong \triangle ADC$

10. Given: $\overline{LP}$ bisects $\overline{MO}$, $\overline{LO} \| \overline{MP}$

    Prove: $\triangle LNO \cong \triangle MNP$

11. Given: $\overline{OE} \perp \overline{MP}$, $\overline{OE}$ bisects $\angle MOP$
    Prove: $\triangle MOE \cong \triangle POE$

12. Given: $\overline{AD} \| \overline{BC}$, $\overline{DC} \| \overline{BA}$
    Prove: $\triangle ADB \cong \triangle CBD$

13. Given: $\overline{AC}$ bisects $\overline{DE}$, $\angle A \cong \angle C$
    Prove: $\triangle ADB \cong \triangle CEB$

14. Given: $\overline{AB} \parallel \overline{CD}$, $\angle B \cong \angle D$,
    $\overline{AB} \cong \overline{CD}$
    Prove: $\triangle ABF \cong \triangle CED$