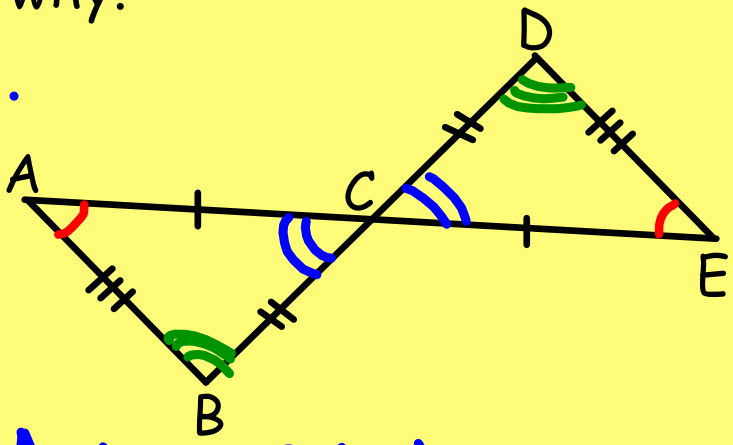
11/4/19 - Warm Up Problem

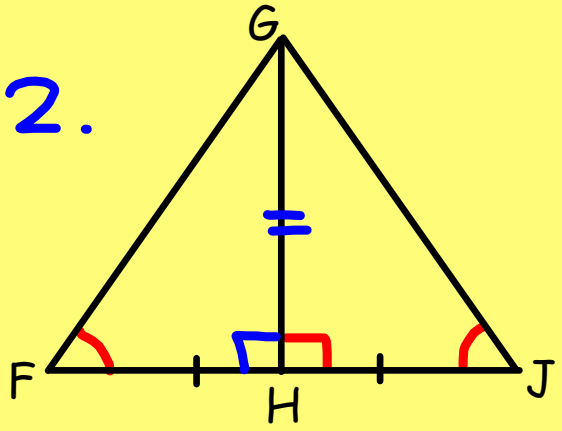
Determine if each pair of polygons is congruent. If they are, write a congruence statement. If they are not, explain why.

1.



$\triangle ABC \cong \triangle EDC$

2.



Not enough info

Sections 4.2-4.3 - Proving Triangles Congruent

Goal: Use the shortcut theorems and postulates to determine if triangles are congruent or not

Congruent Polygons have...

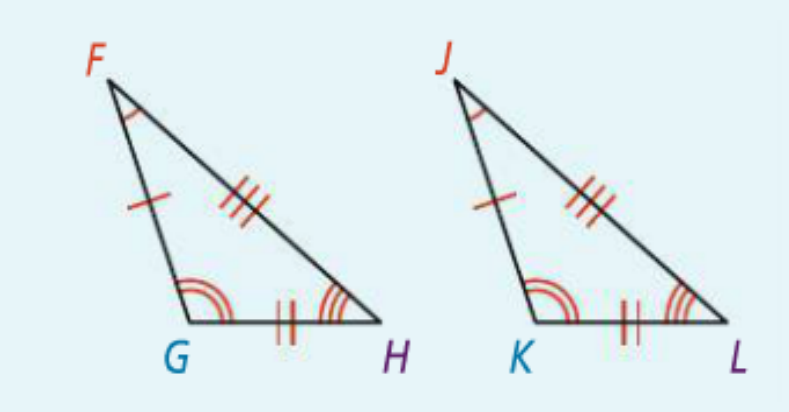
- Corresponding **Sides** that are Congruent
- Corresponding **Angles** that are Congruent

For triangles, that's 3 sets of sides that must be congruent and 3 sets of angles that must be congruent.

$\angle F \cong \angle J$ $\quad \overline{FG} \cong \overline{JK}$

$\angle G \cong \angle K$ $\quad \overline{GH} \cong \overline{KL}$

$\angle H \cong \angle L$ $\quad \overline{FH} \cong \overline{JL}$

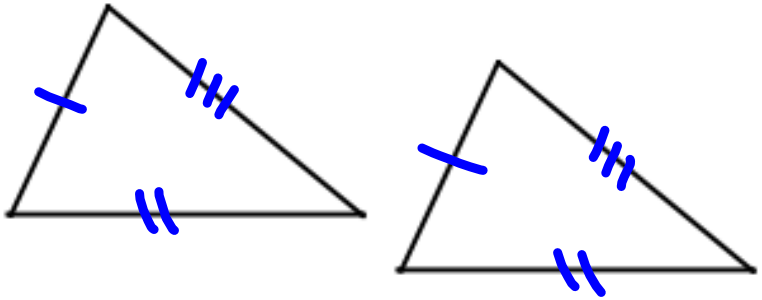


Do we really need to know all 3 sides and all 3 angles?
Today, we are studying some shortcuts we can use on triangles.

Shortcut #1

SIDE-SIDE-SIDE POSTULATE (SSS)

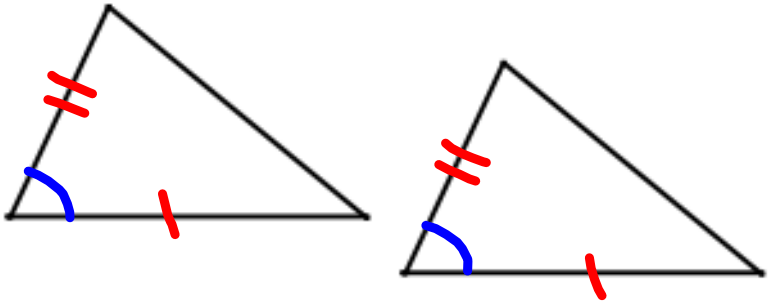
If the sides of one triangle are congruent to the sides of another triangle, then the triangles are congruent.



Shortcut #2

SIDE-ANGLE-SIDE POSTULATE (SAS)

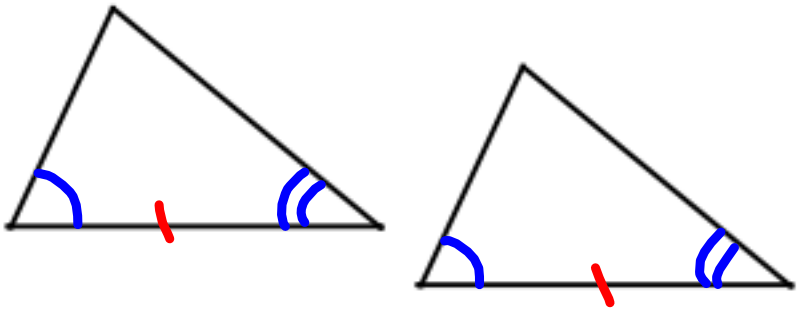
If two sides and the included angle of a triangle are congruent to two sides and the included angle of another triangle, then the triangles are congruent.



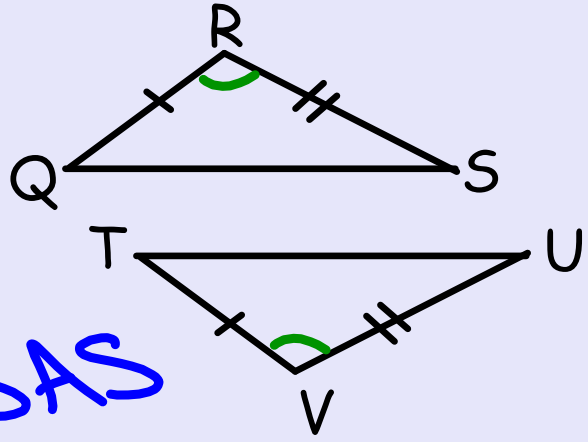
Shortcut #3

ANGLE-SIDE-ANGLE POSTULATE (ASA)

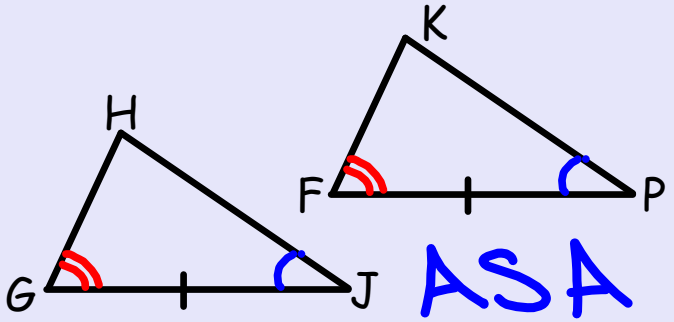
If two angles and the included side of a triangle are congruent to two angles and the included side of another triangle, then the triangles are congruent



Can you use one of the shortcut postulates or theorems to prove the triangles are congruent?

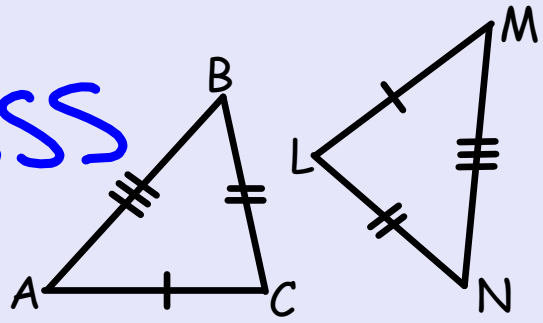


SAS

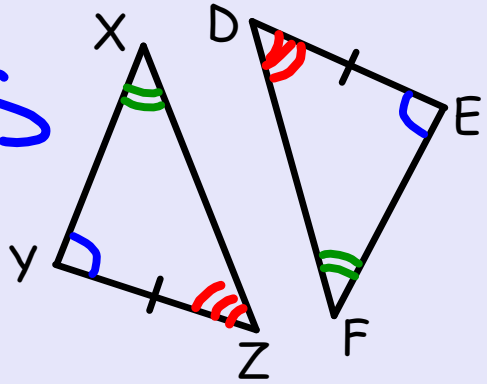


ASA

SSS



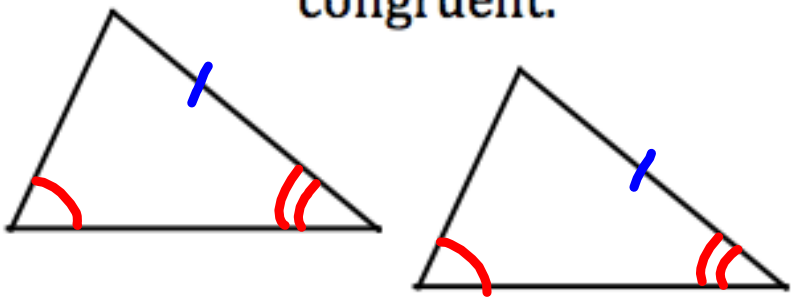
AAS



Shortcut #4

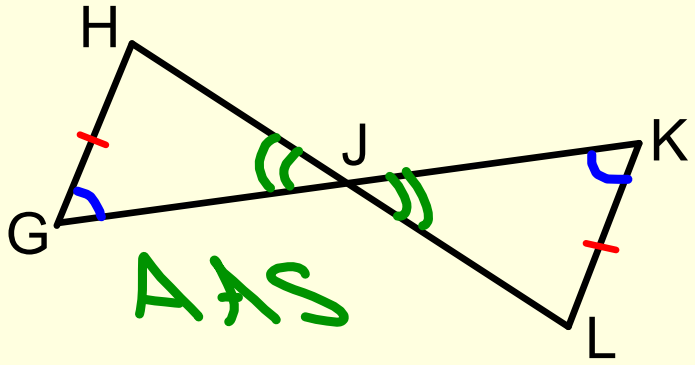
ANGLE-ANGLE-SIDE THEOREM (AAS)

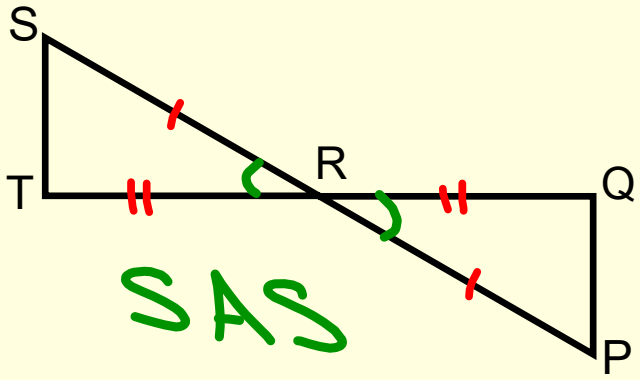
If two angles and a non-included side of atriangle are congruent to two angles and the non-included side of another triangles, then the triangles are congruent.



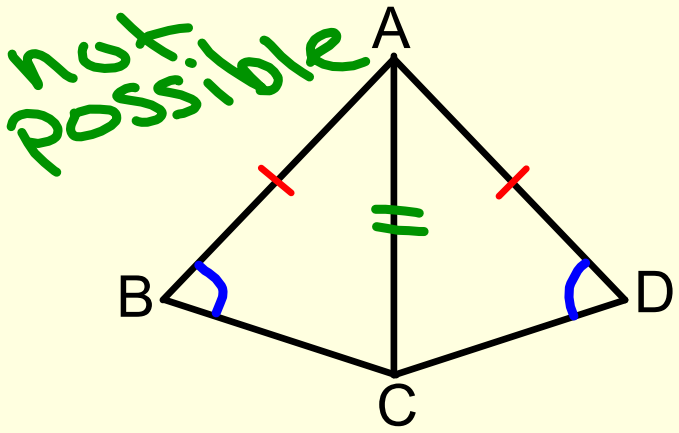
When the triangles are connected in some way, there are usually sides or angles that are congruent that do not have marks.

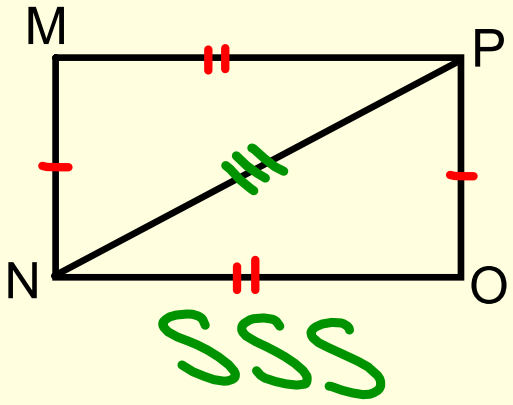
Look out for **Vertical Angles**...





...and sides that both triangles **share**.



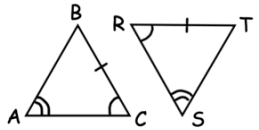


Assignment:

Concept 10 Worksheet (1-10)

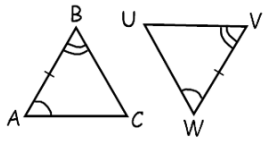
Complete each congruence statement with the name of the 2nd triangle (in the correct order). Then, fill in the second blank with the postulate or theorem that proves they are congruent: *SSS, SAS, AAS,* or *ASA.* There is one pair that is *not possible* to prove congruent.

1.



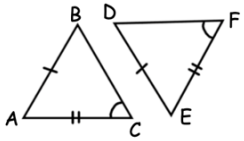
$\Delta ABC \cong \Delta$ STR by AAS

2.



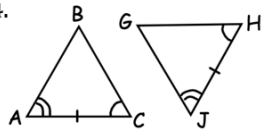
$\Delta ABC \cong \Delta$_____ by _____

3.



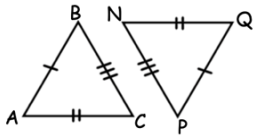
$\Delta ABC \cong \Delta$_____ by _____

4.



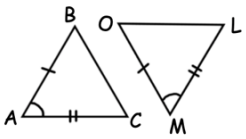
$\Delta ABC \cong \Delta$_____ by _____

5



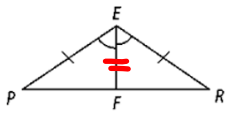
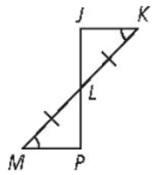
$\Delta ABC \cong \Delta$_____ by _____

6.



$\Delta ABC \cong \Delta$_____ by _____

- **In the 2nd column, fill in the pairs of sides or angles that have congruent marks.**
- **In the 3rd column, fill in one more different pair of sides or angles that is congruent but does not have marks yet and write why it is congruent.**
- **In the last column, fill in why the triangles are congruent: SSS, SAS, ASA, or AAS.**

Diagram	Sides and angles already marked congruent	Not marked, but still congruent	Why are the triangles congruent?
7. 	$\overline{PE} \cong \overline{ER}$ $\angle PEF \cong \angle FER$	$\overline{EF} \cong \overline{EF}$ because... they share it	SAS
8. 	_____ $\cong$ _____ _____ $\cong$ _____	_____ $\cong$ _____ because...	