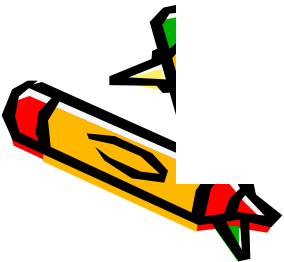
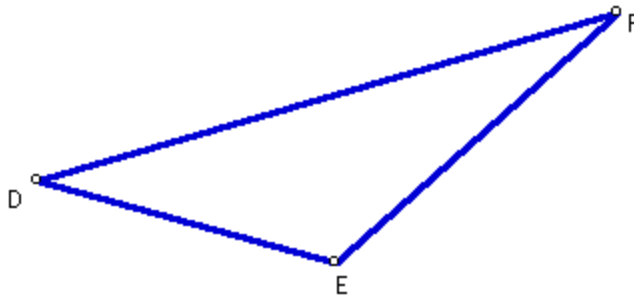
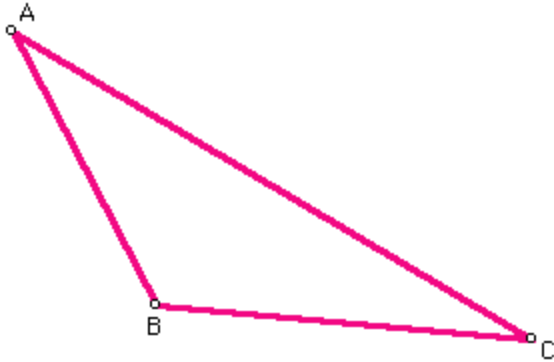


Triangle Congruence



Define congruent....

Triangle ABC is congruent to Triangle FED. Name 6 congruent parts...



IN ORDER FOR TWO TRIANGLES
TO BE CONGRUENT ALL
CORRESPONDING ANGLES AND
SIDES MUST BE CONGRUENT!

Congruency Statement

$\triangle ABC \cong \triangle DEF$

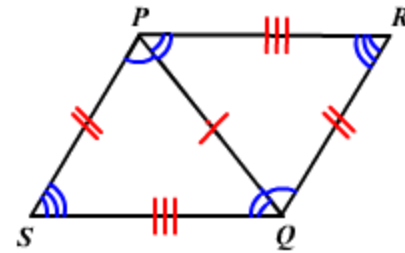
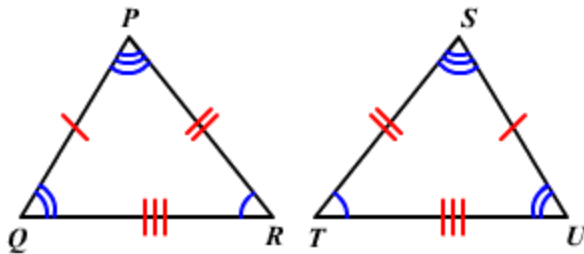
Based on the congruency statement, which angles and which sides must be congruent?



Complete the congruency
statement for the following
triangles...

$\triangle PQR \cong \triangle$ _____

$\triangle PQR \cong \triangle$ _____



Corresponding Parts

Name the corresponding congruent parts for these triangles.

1. $\overline{AB} \cong$ _____

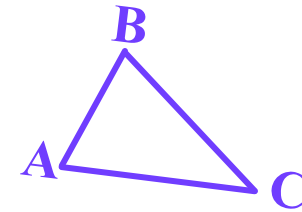
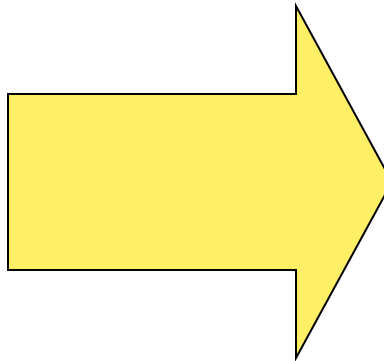
2. $\overline{BC} \cong$ _____

3. $\overline{AC} \cong$ _____

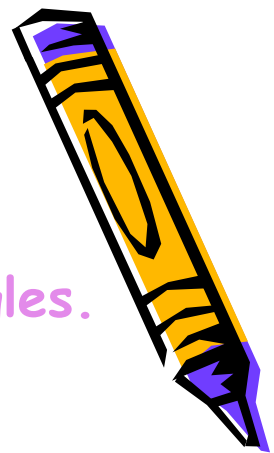
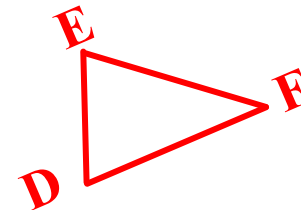
4. $\angle A \cong$ _____

5. $\angle B \cong$ _____

6. $\angle C \cong$ _____

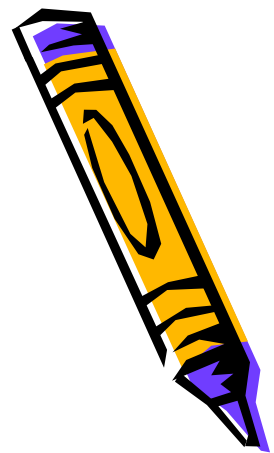


$$\triangle ABC \cong \triangle DEF$$



Do you need *all six* ?

NO !

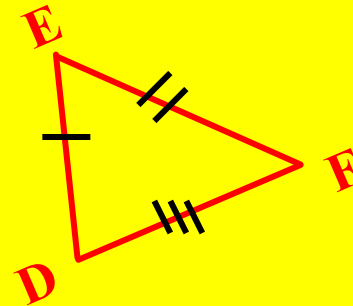
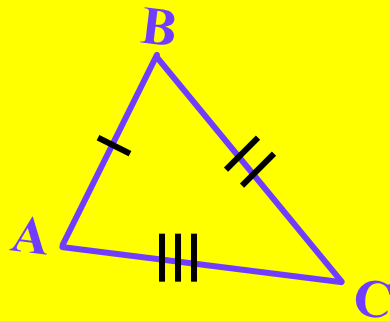


| | |
|---|-----|
| ○ | |
| | SSS |
| ○ | SAS |
| | ASA |
| ○ | AAS |
| | |



Side-Side-Side (SSS)

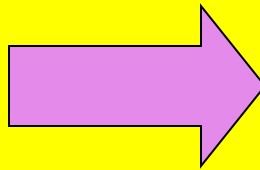
If three sides of one triangle are congruent to three corresponding sides of a second triangle, then the triangles are congruent.



1. $\overline{AB} \cong \overline{DE}$

2. $\overline{BC} \cong \overline{EF}$

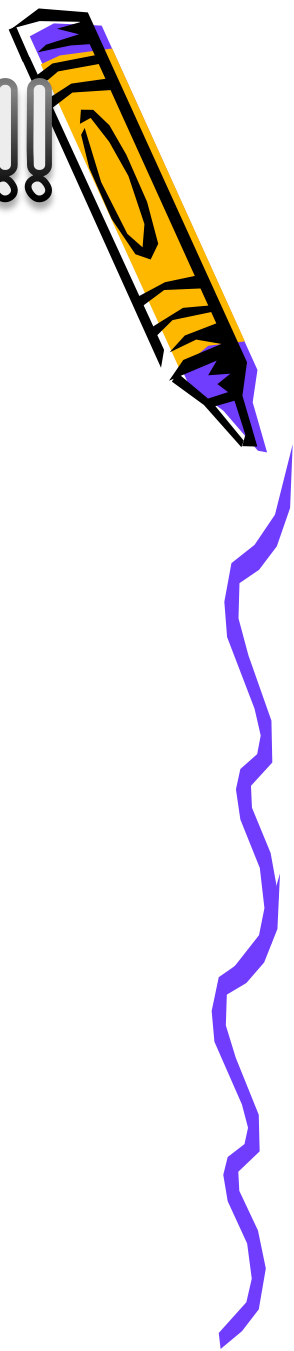
3. $\overline{AC} \cong \overline{DF}$



$\triangle ABC \cong \triangle DEF$

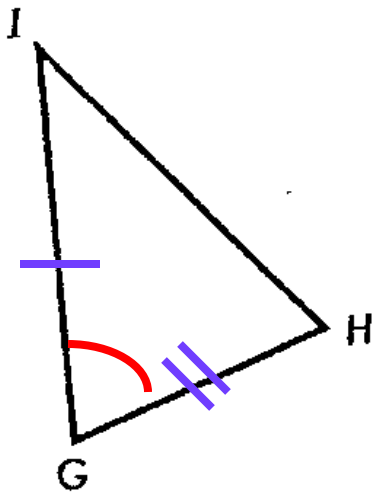
COMERCIAL BREAK!!!!

<http://www.youtube.com/watch?v=o009kN8bCC8>

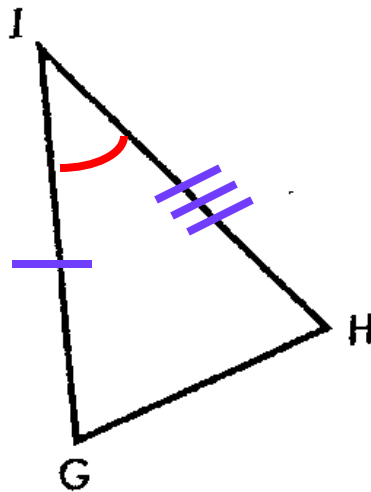


Included Angle

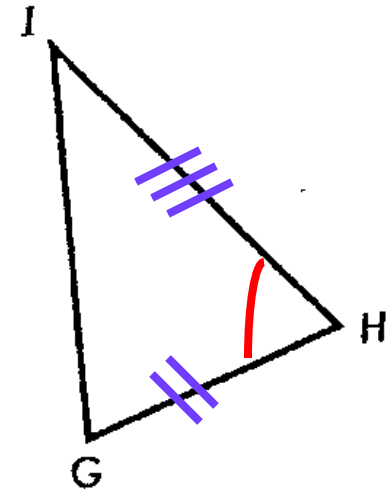
The angle **between** two sides



$\angle G$



$\angle I$

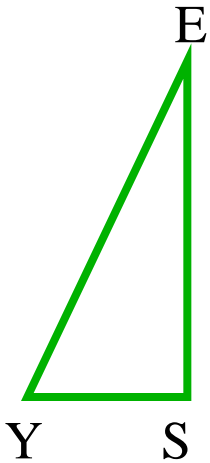


$\angle H$



Included Angle

The included angle is the angle with the letter that both sides share

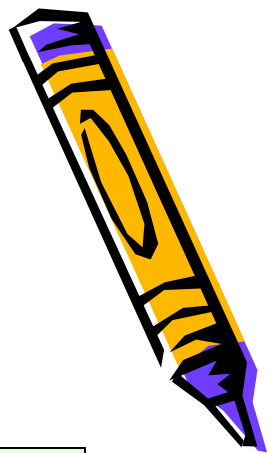


Name the **included** angle:

\overline{YE} and \overline{ES} $\angle E$

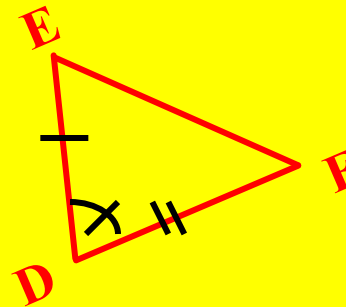
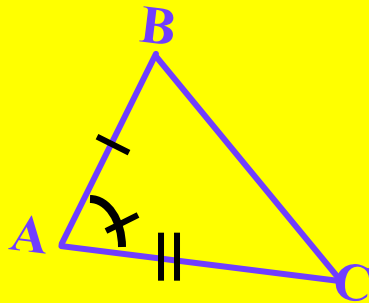
\overline{ES} and \overline{YS} $\angle S$

\overline{YS} and \overline{YE} $\angle Y$



Side-Angle-Side (SAS)

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



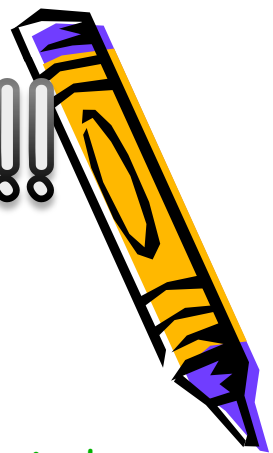
$$1. \overline{AB} \cong \overline{DE}$$

$$2. \angle A \cong \angle D \quad \longrightarrow \quad \triangle ABC \cong \triangle DEF$$

$$3. \overline{AC} \cong \overline{DF}$$

included
angle

COMERCIAL BREAK!!!!

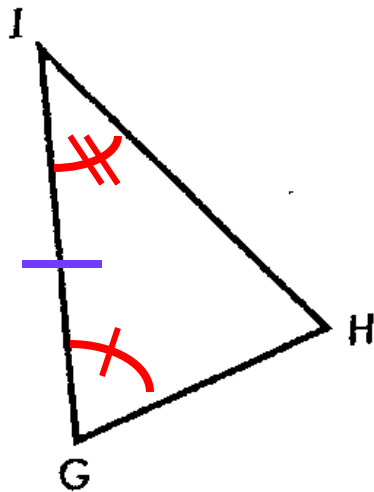


http://www.youtube.com/watch?v=4GZtALwvRaE&feature=grec_index

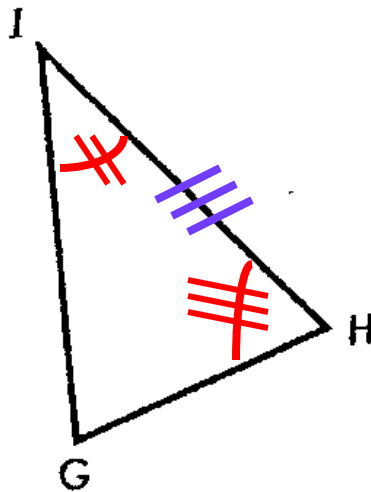


Included Side

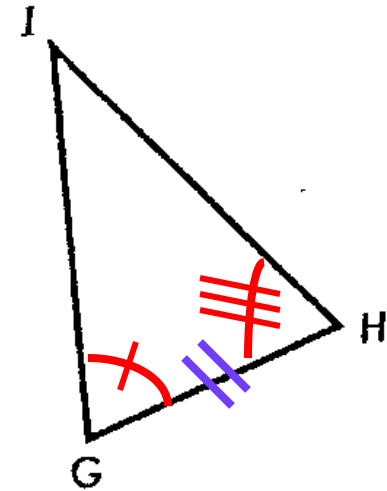
The side **between** two angles



GI



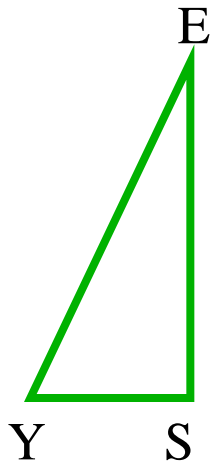
HI



GH



Included Side



Name the **included** angle:

$\angle Y$ and $\angle E$ \overline{YE}

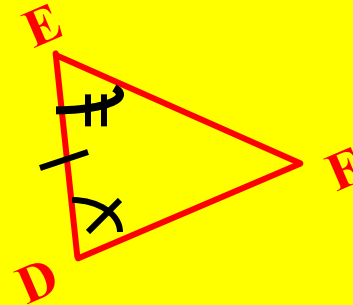
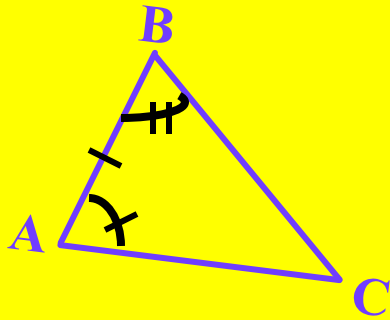
$\angle E$ and $\angle S$ \overline{ES}

$\angle S$ and $\angle Y$ \overline{SY}



Angle-Side-Angle (ASA)

If two angles of a triangle and the included side are congruent the corresponding angles and included side, then the triangles are congruent.



$$1. \angle A \cong \angle D$$

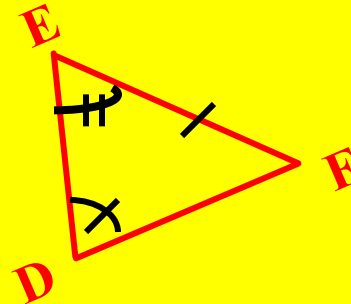
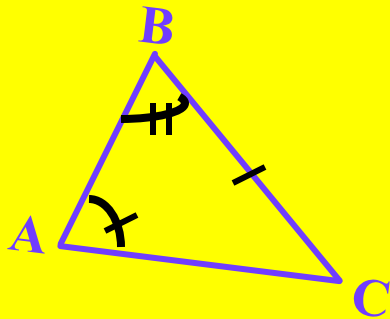
$$2. \overline{AB} \cong \overline{DE} \quad \longrightarrow \quad \triangle ABC \cong \triangle DEF$$

$$3. \angle B \cong \angle E$$

included
side

Angle-Angle-Side (AAS)

If two angles of a triangle and the non-included side are congruent the corresponding angles and non-included side, then the triangles are congruent



$$1. \angle A \cong \angle D$$

$$2. \angle B \cong \angle E \quad \longrightarrow \quad \triangle ABC \cong \triangle DEF$$

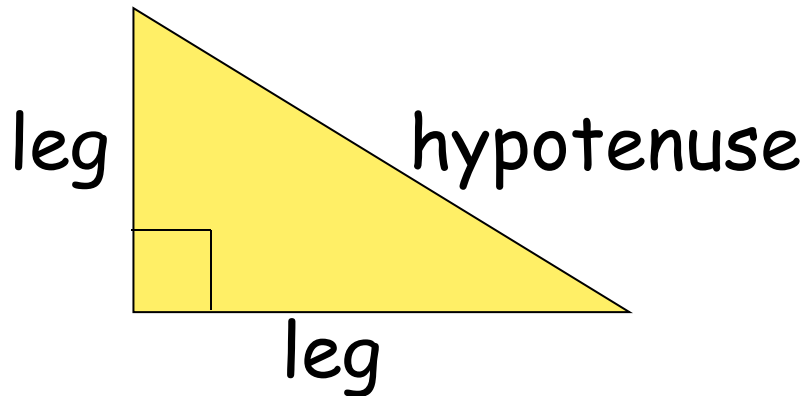
$$3. \overline{BC} \cong \overline{EF} \quad \dots$$

Non-included
side

Side Names of Triangles



- Right Triangles: side across from right angle is the hypotenuse, the remaining two are legs.

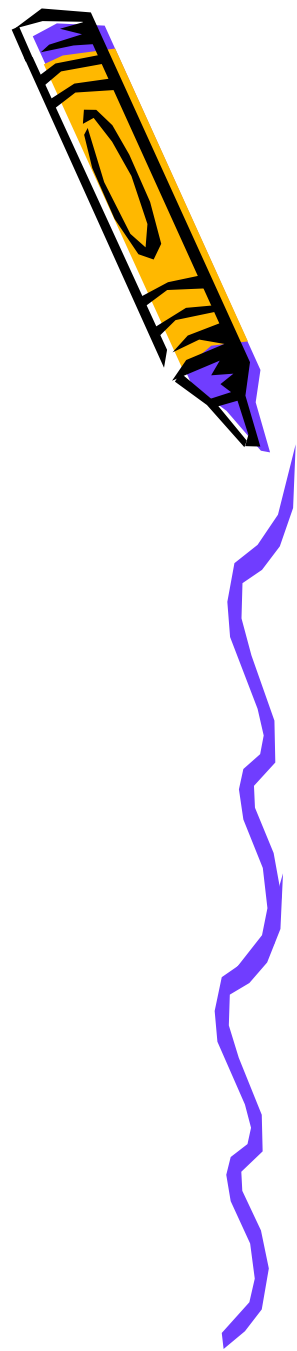
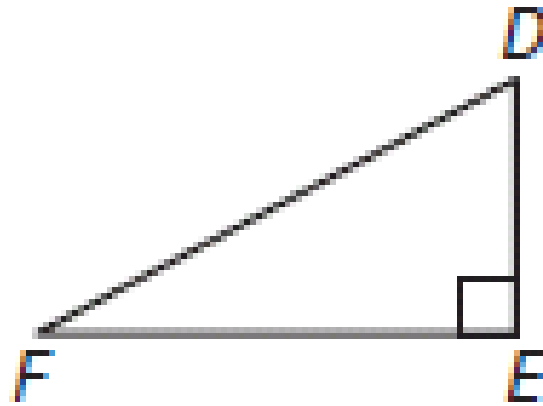


Examples: Tell whether the segment is a leg or a hypotenuse.

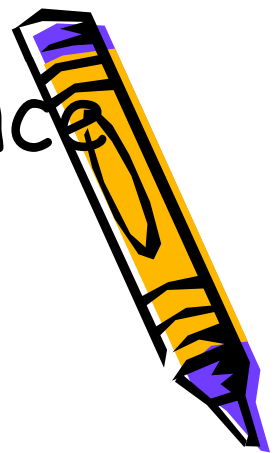
1. \overline{FE}

2. \overline{ED}

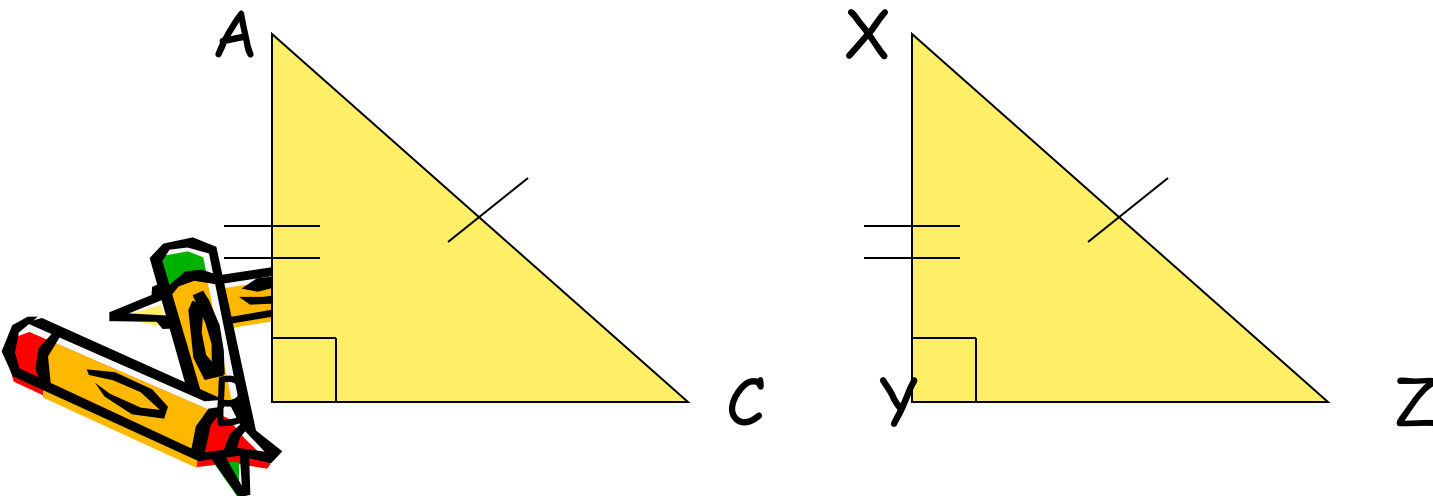
3. \overline{FD}



Hypotenuse- Leg (HL) Congruence Theorem:



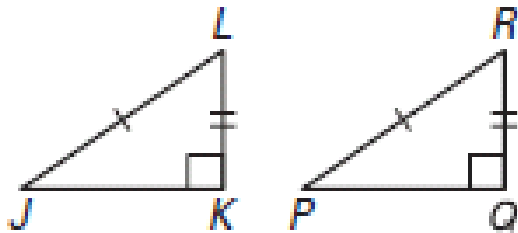
- If the hypotenuse and a leg of a right triangle are congruent to the hypotenuse and leg of a second right triangle, then the two triangles are congruent.
- Example: because of HL.



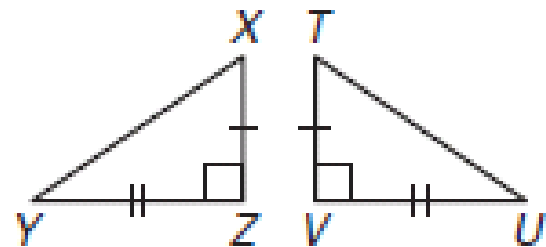
Examples: Determine if the triangles are congruent. State the postulate or theorem.



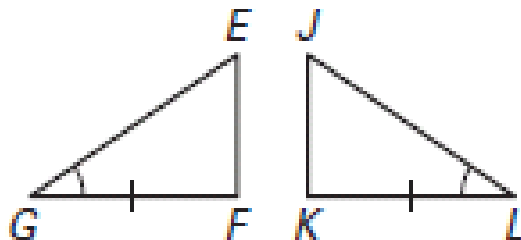
7.



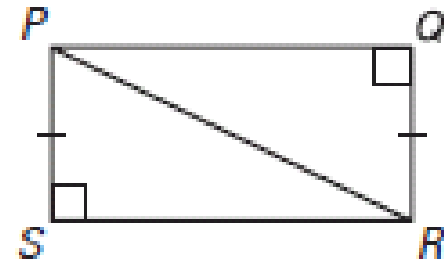
8.



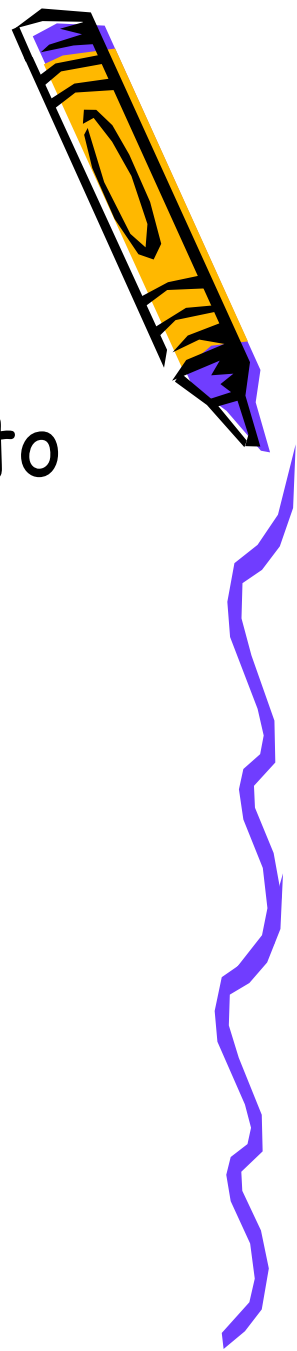
17.



12.



There are 5 ways to prove triangles are congruent...



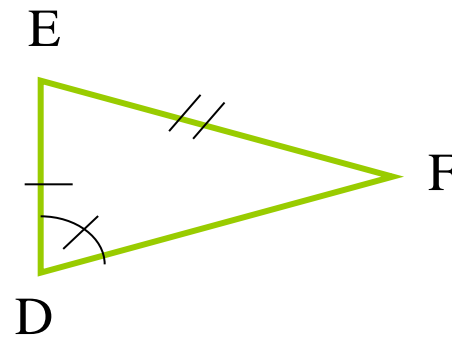
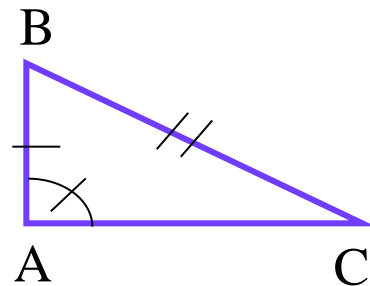
- Each of these ways have 3 things to look for!
 - ASA
 - SAS
 - SSS
 - AAS
 - HL (Right Triangle)



Warning: No ASS or SSA Postulate NO CURSING IN MATH CLASS!



There is no such
thing as an SSA
postulate!

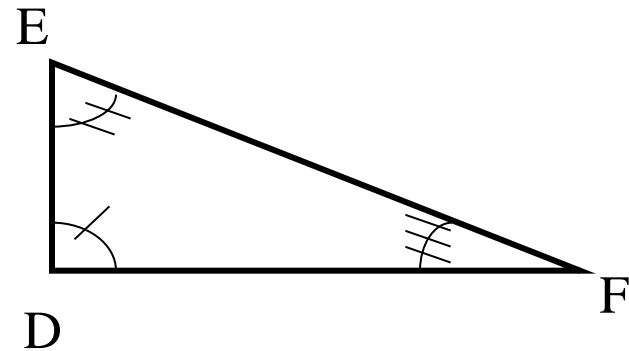
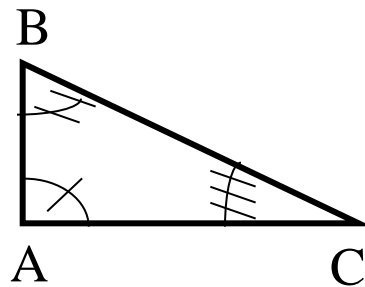


NOT CONGRUENT

Warning: No AAA Postulate



There is no such
thing as an AAA
postulate!



NOT CONGRUENT

The Congruence Postulates

☞ SSS correspondence

☞ ASA correspondence

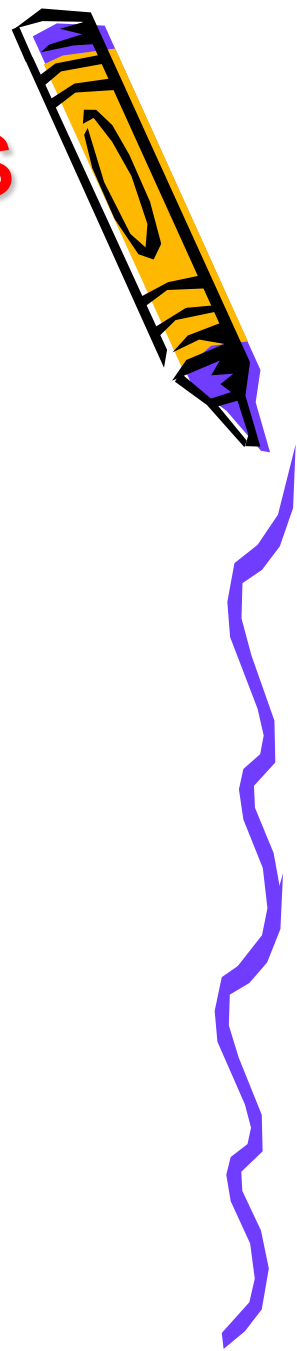
☞ SAS correspondence

☞ AAS correspondence

☞ HL correspondence

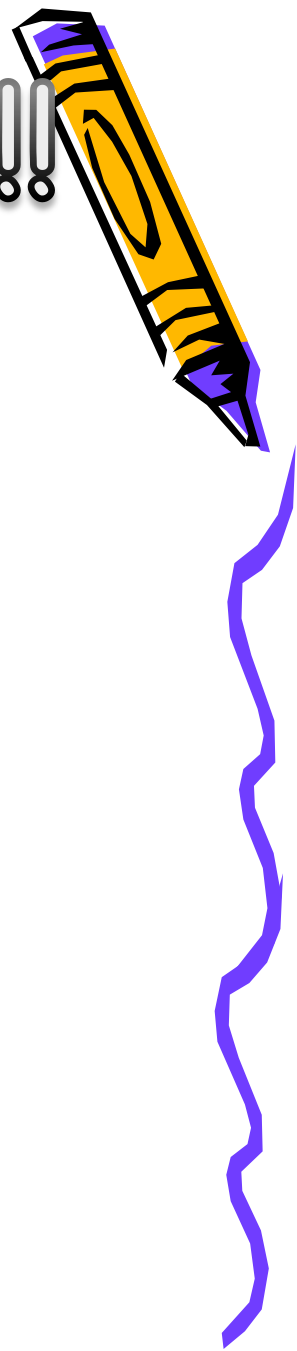
☞ ~~SSA correspondence~~

☞ ~~AAA correspondence~~



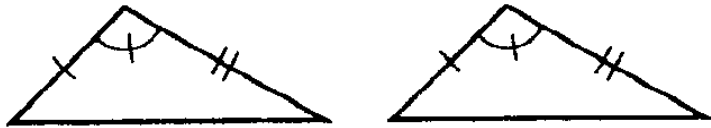
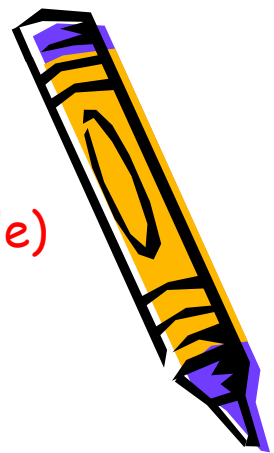
COMERCIAL BREAK!!!!

<http://www.youtube.com/watch?v=hQYfCWak-Q0>

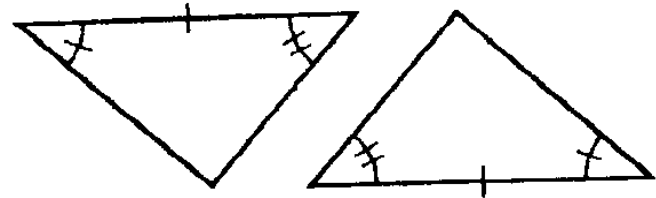


Name That Postulate

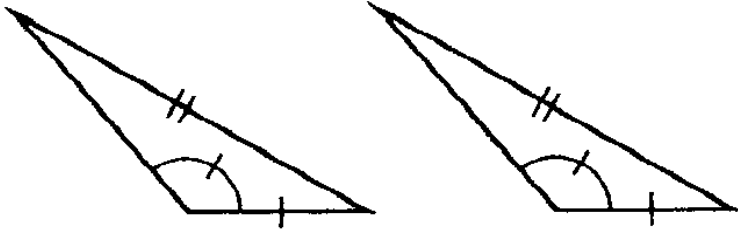
(when possible)



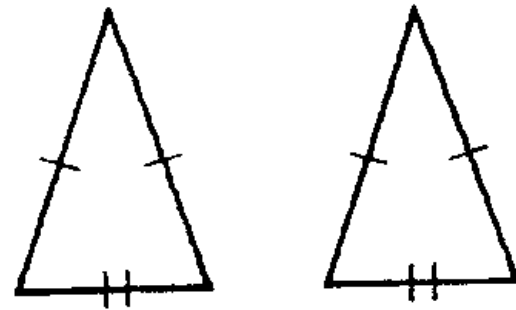
SAS



ASA



~~**SSA**~~

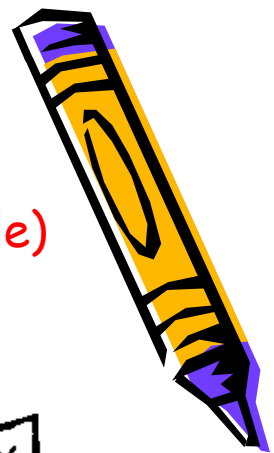


SSS



Name That Postulate

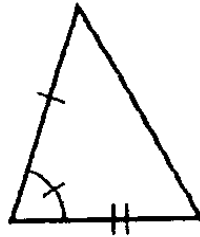
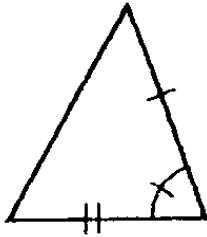
(when possible)



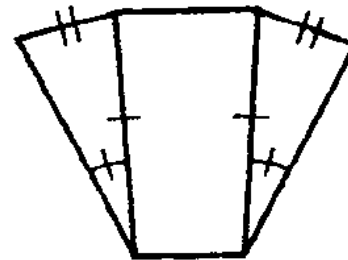
~~AAA~~



ASA



SAS

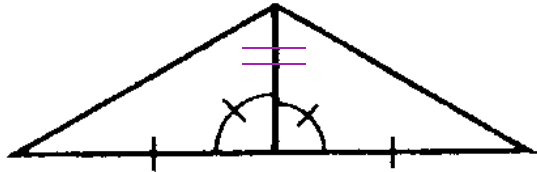
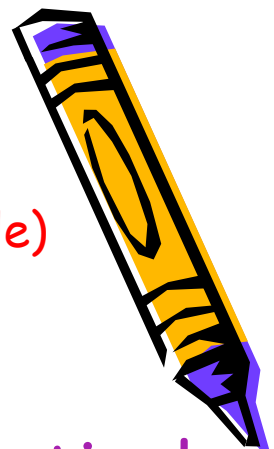


~~SSA~~



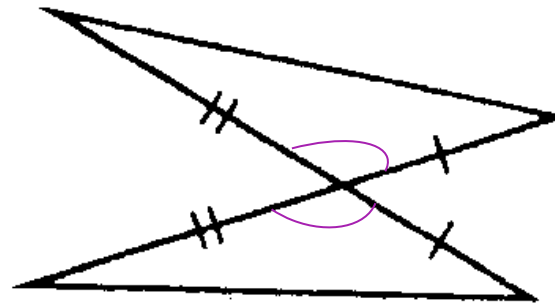
Name That Postulate

(when possible)



Reflexive
Property

SAS

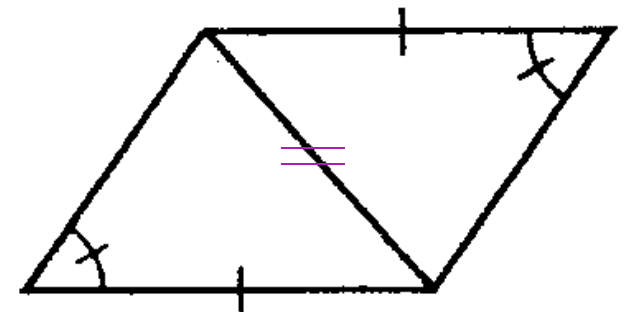


Vertical
Angles
SAS



Vertical
Angles

SAS



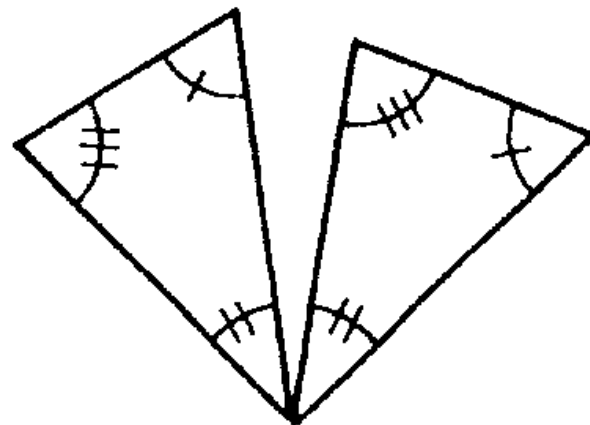
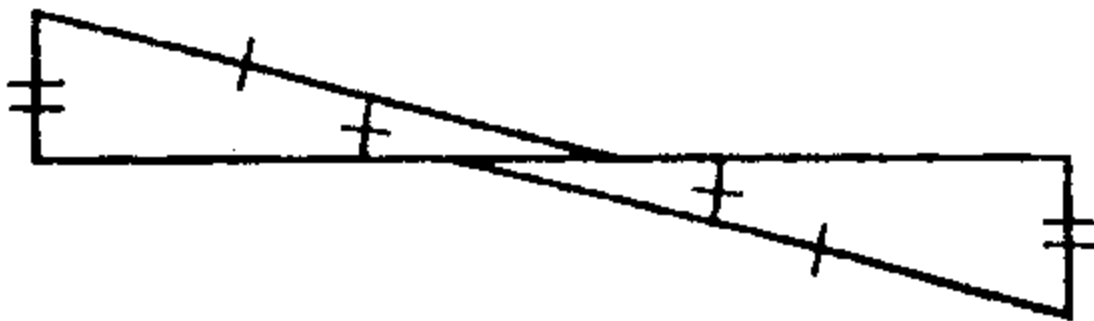
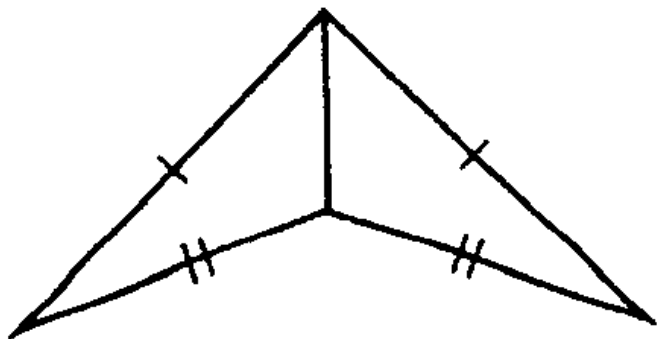
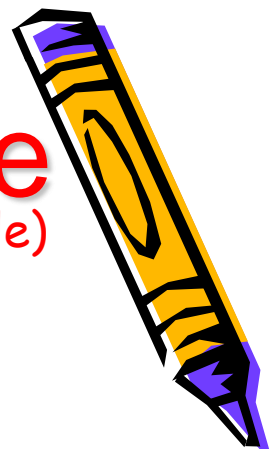
Reflexive
Property

~~**SSA**~~



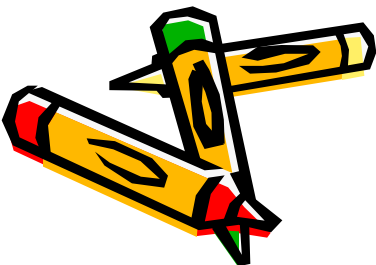
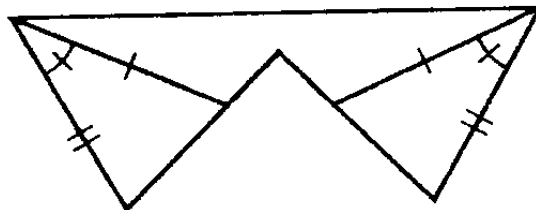
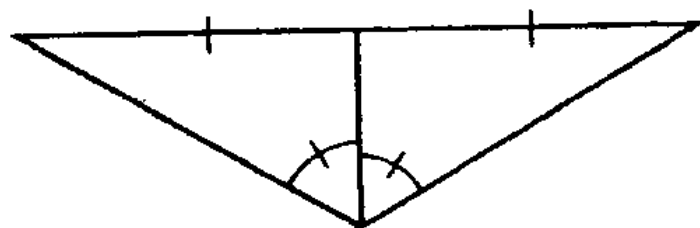
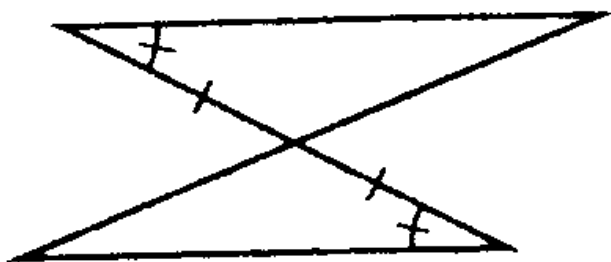
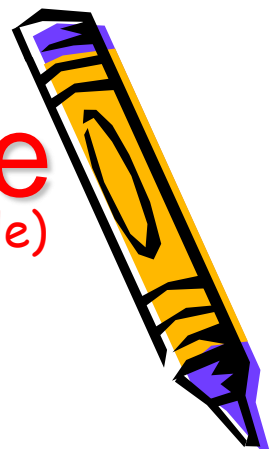
You try! Name That Postulate

(when possible)



You try! Name That Postulate

(when possible)



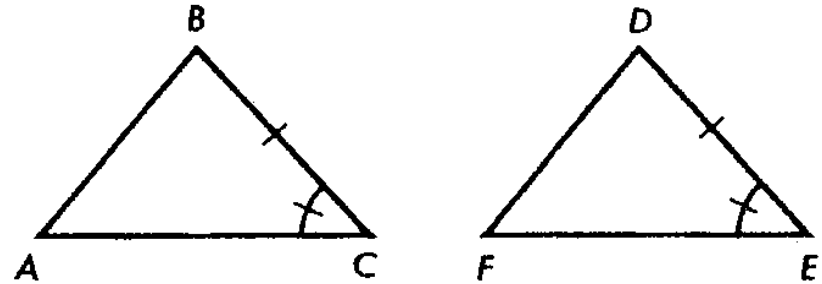
Let's Practice

Indicate the additional information needed to enable us to apply the specified congruence postulate.

For ASA: $\angle B \cong \angle D$

For SAS: $\overline{AC} \cong \overline{FE}$

For AAS: $\angle A \cong \angle F$



You Try!

Indicate the additional information needed to enable us to apply the specified congruence postulate.

For ASA:

For SAS:

For AAS:

