4-2 Triangle Congruence by SSS and SAS Notes

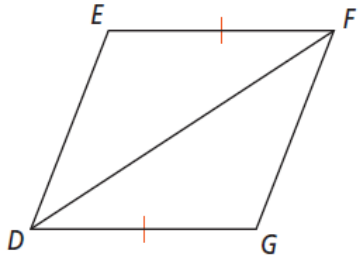
1) What angle is included between $\overline{ED}$ and $\overline{EF}$?_____

2) Which sides include ∠G? _____

3) Which sides include $\angle GDF$? _____

4) What is a non-included side for ∠E? _____

5) What are the two non-included angles for $\overline{ED}$ and $\overline{DF}$? _____

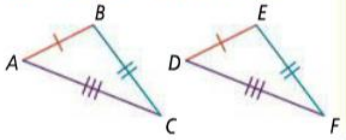


take note

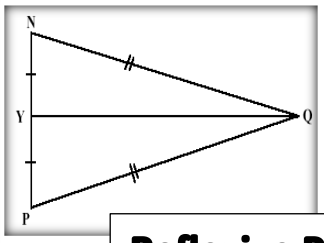
Postulate 4-1 Side-Side-Side (SSS) Postulate

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

If . . .
$\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, $\overline{AC} \cong \overline{DF}$



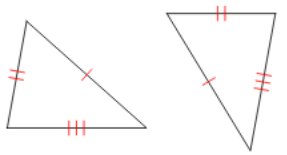
Then . . .
$\triangle ABC \cong \triangle DEF$



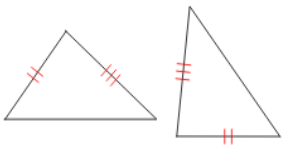
Reflexive Property!

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

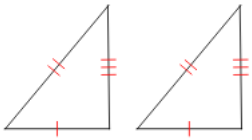
1)



2)



4)



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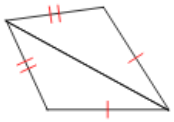
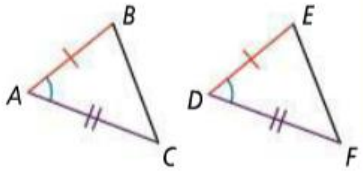


take note

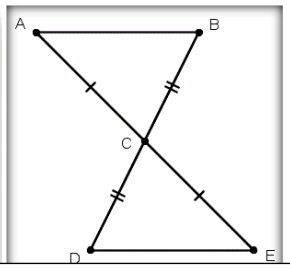
Postulate 4-2 Side-Angle-Side (SAS) Postulate

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

If . . .
$\overline{AB} \cong \overline{DE}$, $\angle A \cong \angle D$, $\overline{AC} \cong \overline{DF}$

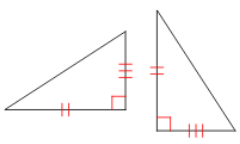


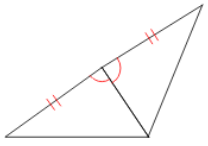
Then . . .
$\triangle ABC \cong \triangle DEF$

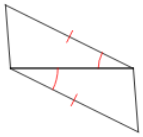


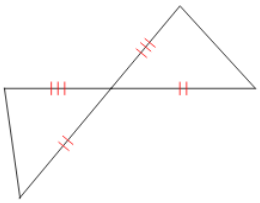
Vertical Angle Theorem!

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



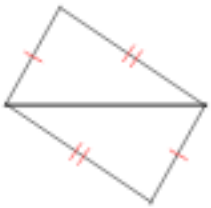






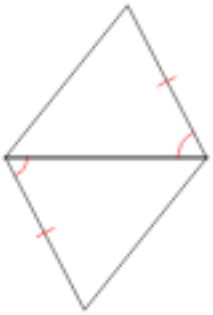
State if the two triangles are congruent. If they are, state how you know.

1)



2)

3)



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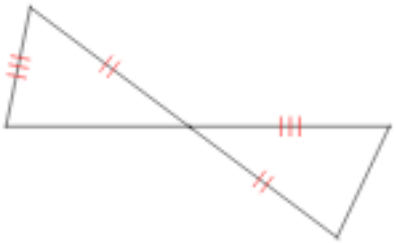

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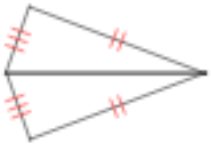

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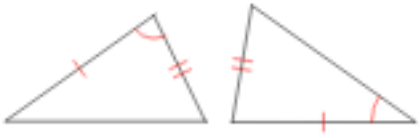
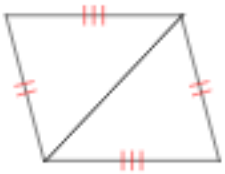


7)

8)



9)

10)

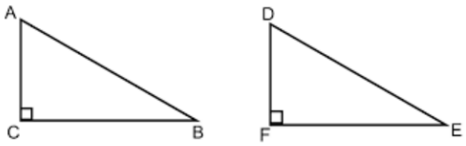
11)

12)

Common Ways to Prove Angles Congruent

Name _____

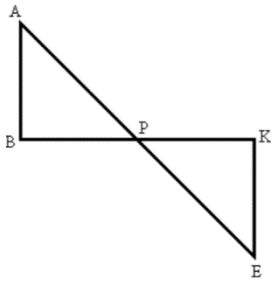
#1.



Given: $\angle C$ *and* $\angle F$ are right angles

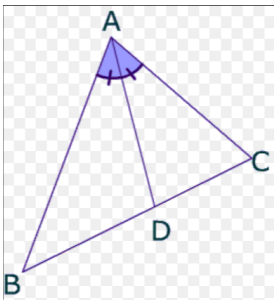
$\angle C \cong \angle F$ _____

#2.



$\angle APB \cong \angle EPK$ _____

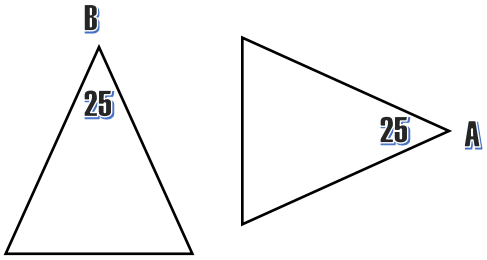
#3.



Given: $\overline{AD}$ *bisects* $\angle BAC$

$\angle BAD \cong \angle DAC$ _____

#4.

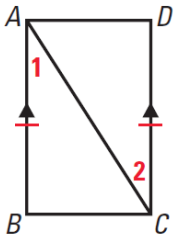


Given: $m\angle B = 25°, m\angle A = 25°$

$m\angle B = m\angle A$ _____

$\angle B \cong \angle A$ _____

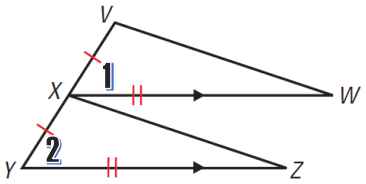
#5.



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

$\angle 1 \cong \angle 2$ _____

#6.

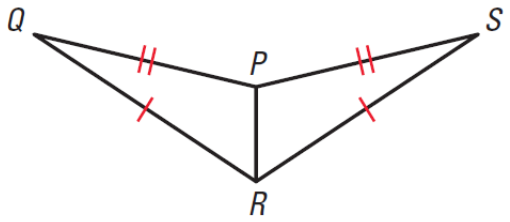


Given: $\overline{XW} \parallel \overline{YZ}$

$\angle 1 \cong \angle 2$ _____

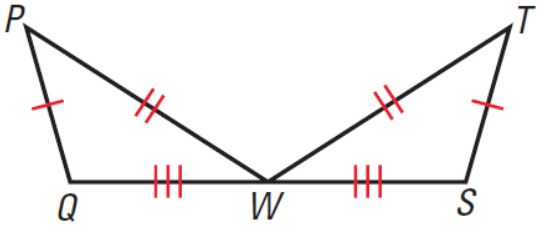
Common Ways to Prove Segments Congruent

#7.



$\overline{PR} \cong \overline{PR}$ _____

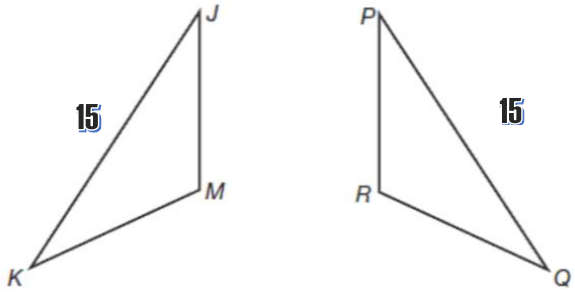
#8.



Given: W is the midpoint of $\overline{QS}$

$\overline{QW} \cong \overline{WS}$ _____

#9.

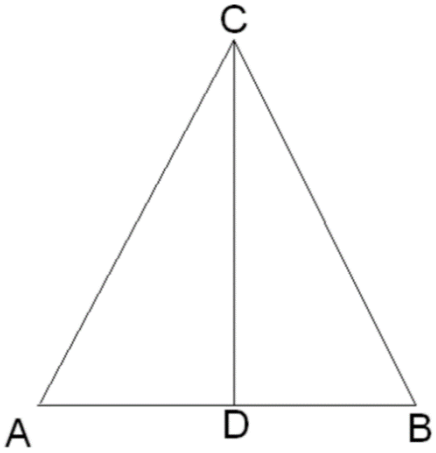


Given: $JK = 15,\ PQ = 15$

$JK = PQ$ _____

$\overline{JK} \cong \overline{PQ}$ _____

#10.



Given: $\overline{CD}$ *bisects* $\overline{AB}$

$\overline{AD} \cong \overline{DB}$ _____

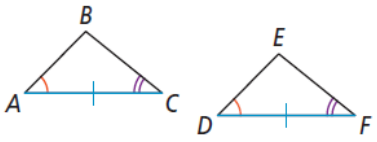
4-3 Triangle Congruence by ASA and AAS Notes

take note

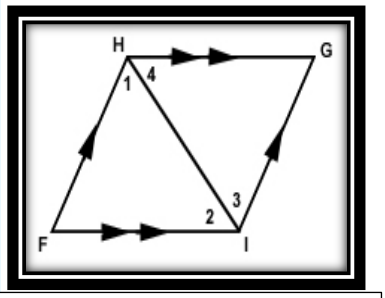
Postulate 4-3 Angle-Side-Angle (ASA) Postulate

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

If . . .
$\angle A \cong \angle D$, $\overline{AC} \cong \overline{DF}$, $\angle C \cong \angle F$

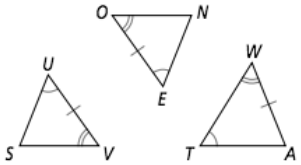


Then . . .
$\triangle ABC \cong \triangle DEF$



Parallel Lines!

Write a congruence statement for the two triangles that could be proven congruent by ASA.

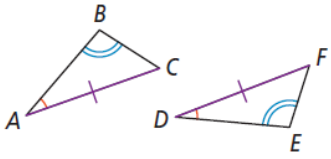


take note

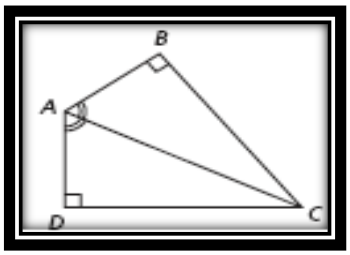
Theorem 4-2 Angle-Angle-Side (AAS) Theorem

Theorem
If two angles and a nonincluded side of one triangle are congruent to two angles and the corresponding nonincluded side of another triangle, then the triangles are congruent.

If . . .
$\angle A \cong \angle D$, $\angle B \cong \angle E$, $\overline{AC} \cong \overline{DF}$

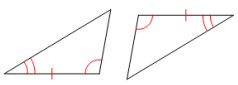


Then . . .
$\triangle ABC \cong \triangle DEF$

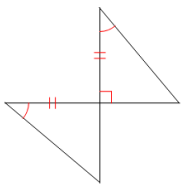


Are the following pairs of triangles congruent? If so, state the theorem or postulate you would use to prove them congruent.

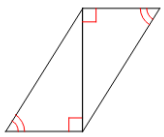
1)



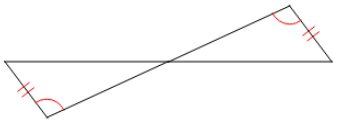
2)



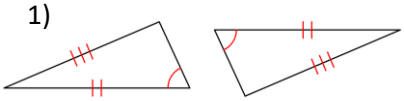
3)

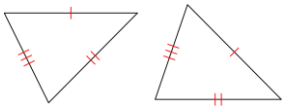


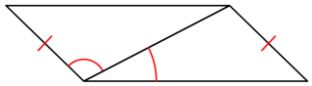
4)

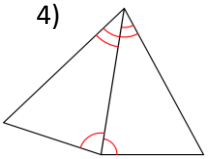


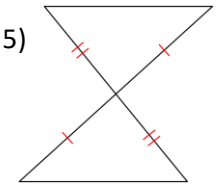
Are the following pairs of triangles congruent?
If so, state the theorem or postulate you would use to prove them congruent.

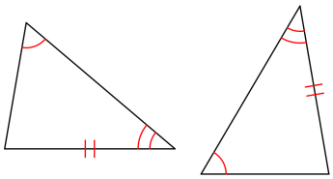
1) 

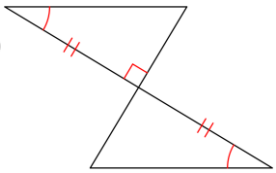
2) 

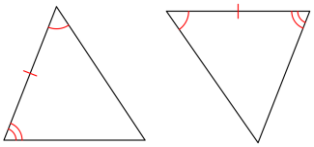
3) 

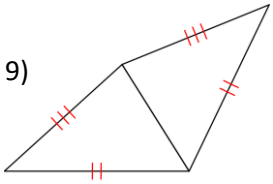
4) 

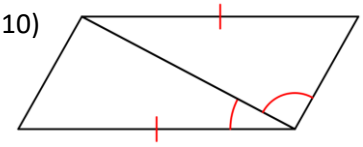
5) 

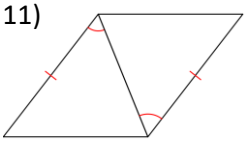
6) 

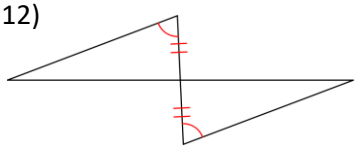
7) 

8) 

9) 

10) 

11) 

12) 

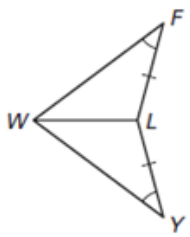
State the third congruence that must be given to prove that $\triangle ABC \cong \triangle XYZ$, using the indicated postulate or theorem.

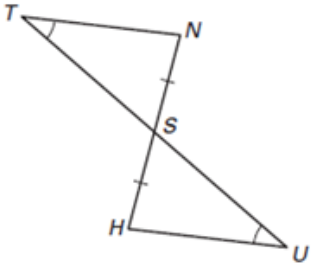
4. **Given:** $\angle A \cong \angle X$, $\angle B \cong \angle Y$
Method: AAS Congruence Theorem

5. **Given:** $\angle A \cong \angle X$, $\overline{AB} \cong \overline{XY}$
Method: ASA Congruence Postulate

6. **Given:** $\angle C \cong \angle Z$, $\overline{BC} \cong \overline{YZ}$
Method: AAS Congruence Theorem

Is it possible to prove that the triangles are congruent? If so, state the postulate or theorem you would use. Explain your reasoning.

7. 

8. 

9.