

CONGRUENT TRIANGLES

Congruent Triangles

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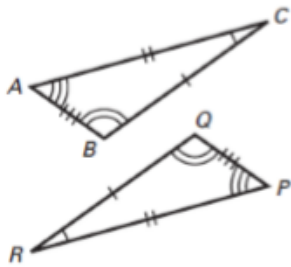
What does congruent mean?

There are five different "short cuts" to prove that triangles are congruent.

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**Congruent Triangles**

Two triangles are congruent if all 3 pairs of corresponding sides and all 3 pairs of corresponding angles are congruent.



$\triangle ABC \cong \triangle \underline{\hspace{2cm}}$

One more thing about triangles!

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**Triangle Sum Theorem**

The diagram shows a triangle with interior angles labeled  $a$ ,  $b$ , and  $c$ . The top angle is  $b$ , the bottom-left angle is  $a$ , and the bottom-right angle is  $c$ . The sides are labeled  $a$ ,  $b$ , and  $c$  at their respective vertices.

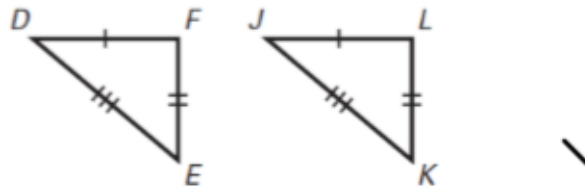
The sum of the three interior angles in a triangle is always  $180^\circ$ .

$$\angle a + \angle b + \angle c = 180^\circ$$

## Side-Side-Side (SSS)

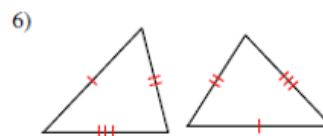
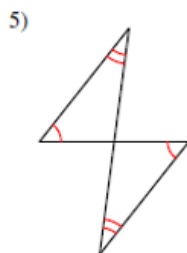
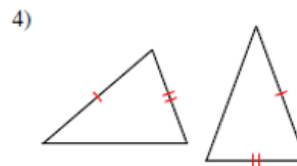
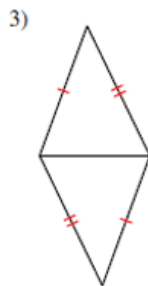
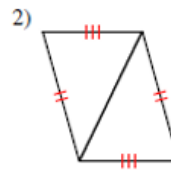
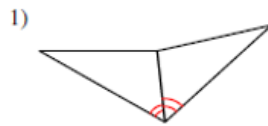
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If three sides of one triangle are congruent to three sides of another triangle, then the two triangles are congruent.



**Determine if the triangles can be proved congruent using SSS.**

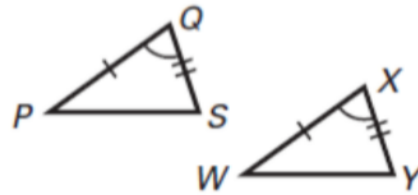
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## Side-Angle-Side (SAS)

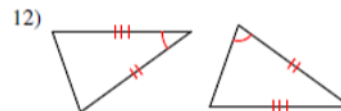
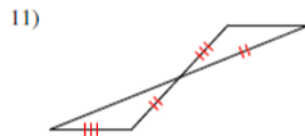
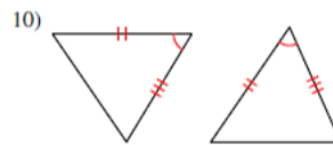
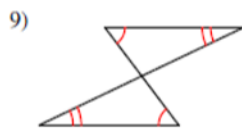
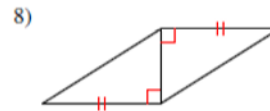
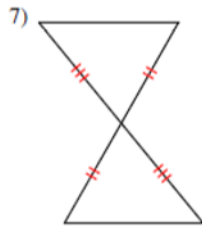
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If two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, then the triangles are congruent.



**Determine if the triangles can be proved congruent using SAS.**

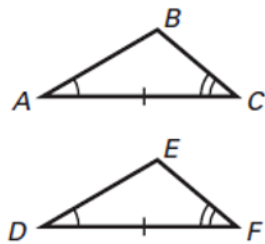
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## Angle-Side-Angle (ASA)

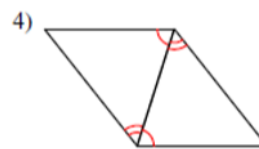
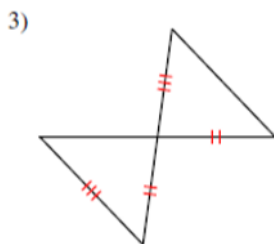
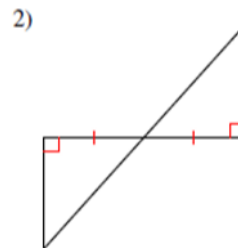
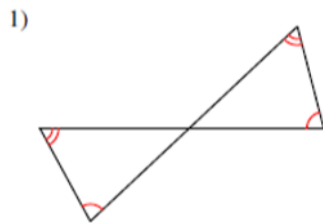
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If two angles and the included side of one triangle are congruent to two angles and the included side of another triangle, then the triangles are congruent.



**Determine if the triangles can be proved congruent using ASA.**

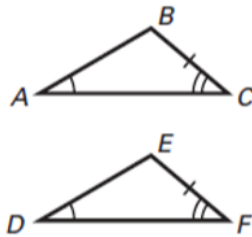
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## Angle-Angle-Side (AAS)

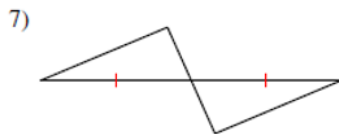
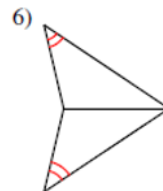
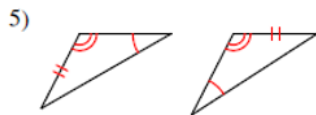
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If two angles and a non-included side of one triangle are congruent to the two angles and the corresponding non-included side of another triangle, then the two triangles are congruent.



**Determine if the triangles can be proved congruent using AAS.**

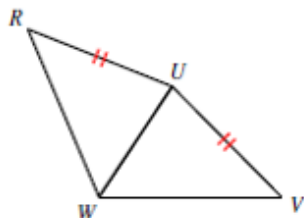
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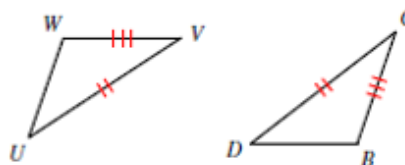
**State the additional information that is required in order to prove the triangles are congruent for the reason given.**

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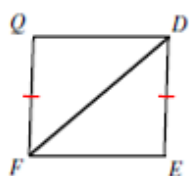
21) SSS



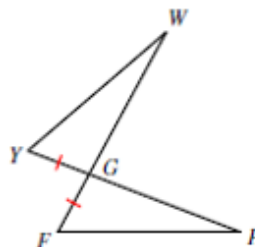
22) SSS



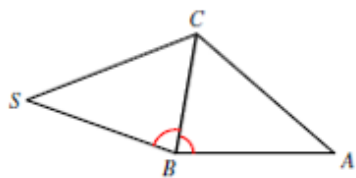
23) SSS



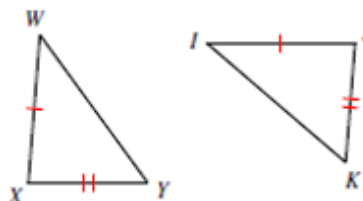
24) SAS



25) SAS



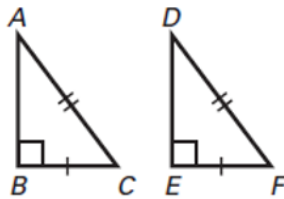
26) SAS



## Hypotenuse-Leg (HL)

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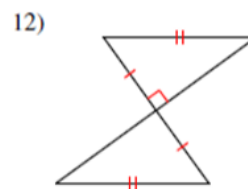
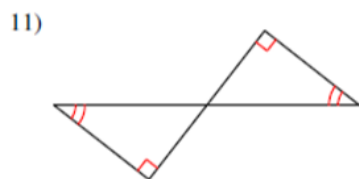
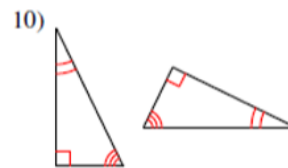
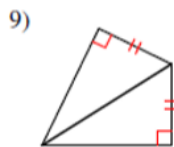
If the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and a leg of another right triangle, then the two triangles are congruent.



**THIS IS FOR RIGHT TRIANGLES ONLY!!!**

**Determine if the triangles can be proved congruent using HL.**

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**Determine if the triangles can be proved congruent using ASA, AAS, or HL.**

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13)



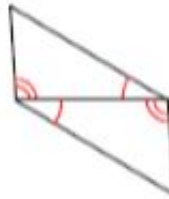
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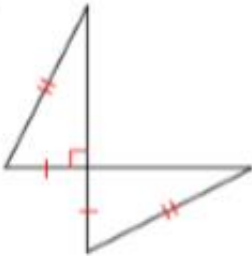
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16)



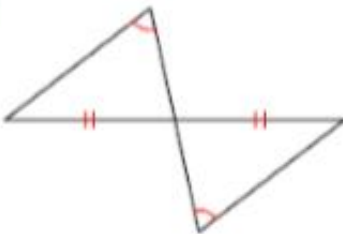
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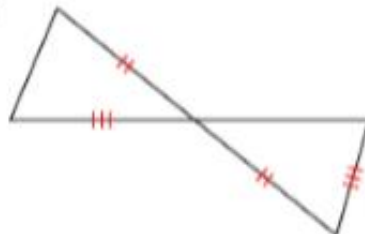
18)



19)



20)





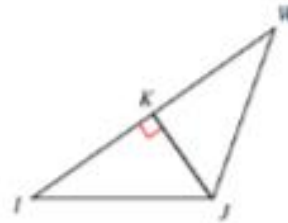
**State the additional information that is required in order to prove the triangles are congruent for the reason given.**

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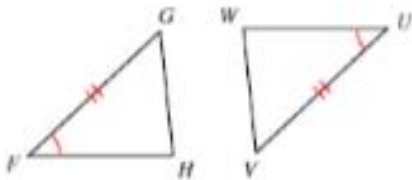
21) AAS



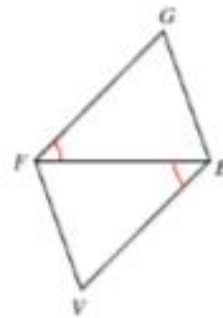
22) HL



23) ASA



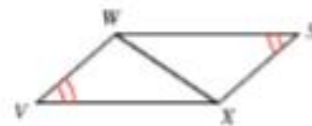
24) ASA



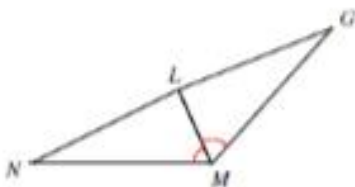
25) HL



26) AAS



27) ASA



28) AAS

