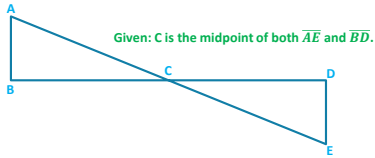## Warmup 2/(The age you turn on your quinceañera) Created by Ms. Marlin
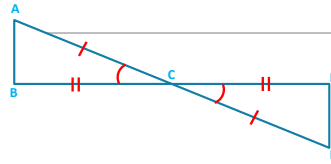
1. Are the triangles congruent? Explain why or why not.

Given: C is the midpoint of both $\overline{AE}$ and $\overline{BD}$.

2. Early finisher (I meant to do this yesterday)

Solve for i: $9x - 7i > 9x - 21u$

Are the triangles congruent? Explain why or why not. Write the congruence statements for each pair of sides or angles in your explanation. Given: C is the midpoint of both $\overline{AE}$ and $\overline{BD}$.

- $\overline{AC} \cong \overline{EC}$ because **C** is the midpoint of $\overline{AE}$.
- $\overline{BC} \cong \overline{DC}$ because **C** is the midpoint of $\overline{BD}$.
- $\angle ACB \cong \angle ECD$ because vertical angles are congruent.
- So the triangles are congruent by SAS.

10.

11.

12.

13.

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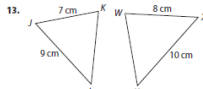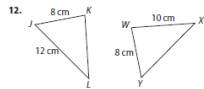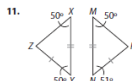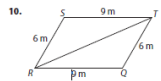
14. Carol bought two chairs with triangular backs. For what value of x can you use a triangle congruence theorem to show that the triangles are congruent? Which triangle congruence theorem can you use? Explain.

2.

3.

4.

5.

6.

7.
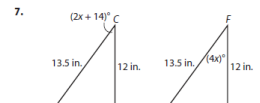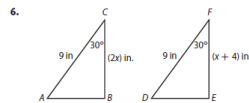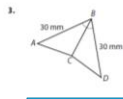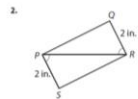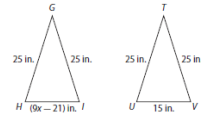
What if…

We only knew two sides of two triangles and a non-included angle? Would that be enough to determine congruence?
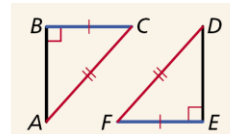
A Video…

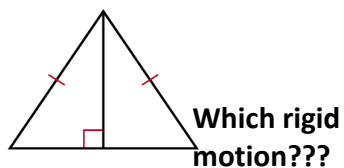## SSA is not a shortcut!

Write down when it is not a shortcut.

HL Congruence (Special Case of SSA)

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

$\triangle ABC \cong$

Example of HL Congruence

Which rigid motion???

Objective: Explore Triangle Congruence

Triangle Angle Sum Theorem

All of the angles in a triangle sum to 180 degrees

Discuss with your trio

Do you think that AAA works as a shortcut?
◦ In other words, if we know all of the angles of two triangles are congruent, do we know that the two triangles are congruent?

AAA is not a shortcut!

Write down why it is not a shortcut.

An **included side** is the common side of two consecutive angles in a polygon. The following postulate uses the idea of an included side.
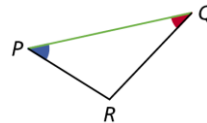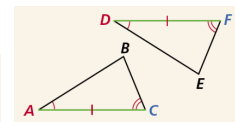
$\overline{PQ}$ is the included side of $\angle P$ and $\angle Q$.
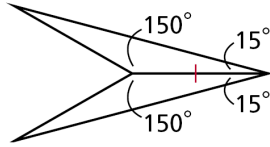
ASA Activity

ASA Congruence

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.
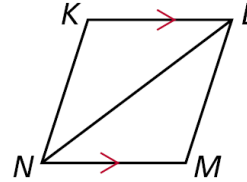
$\triangle ABC \cong \triangle DEF$
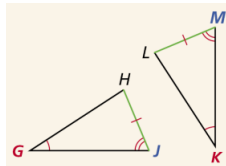
Example of ASA Congruence

150°
15°
15°
150°

Determine if you can use ASA to prove ΔNKL ≅ ΔLMN. Explain.

K — L
N — M

By the Alternate Interior Angles Theorem. ∠KLN ≅ ∠MNL and ∠KNL ≅ ∠MLN. NL ≅ LN by the Reflexive Property. So ASA can be applied.
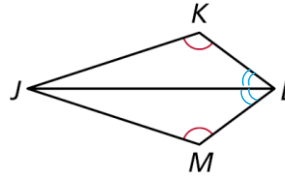
AAS Congruence

If two angles and a nonincluded side of one triangle are congruent to the corresponding angles and nonincluded side of another triangle, then the triangles are congruent.
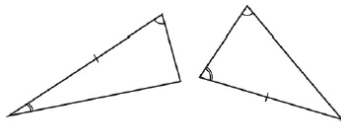
M
L
H
G   J   K

△GHJ ≅ △KLM

Example of AAS Congruence

Given: $\overline{JL}$ **bisects** ∠KLM

K
J — L
M

Determine if you can use AAS to prove that the triangles are congruent.

No. For the triangle on the left, the side is an included side.

Write Down all the Three Letter Variations of the Combinations of the letters A and S

For example: SSS

Circle which ones work as shortcuts and which ones do not work as shortcuts

Group the ones that mean the same thing!

For example: AAS is the same as SAA

Works As a Shortcut	Does Not Work As a Shortcut
SSS	SSA/ASS *
SAS	AAA
HL	
ASA	
AAS/SAA	
	*works in some cases

Homework

ASA pg. 1007-1008 (3-6)

AAS pg. 1060 (1-7)