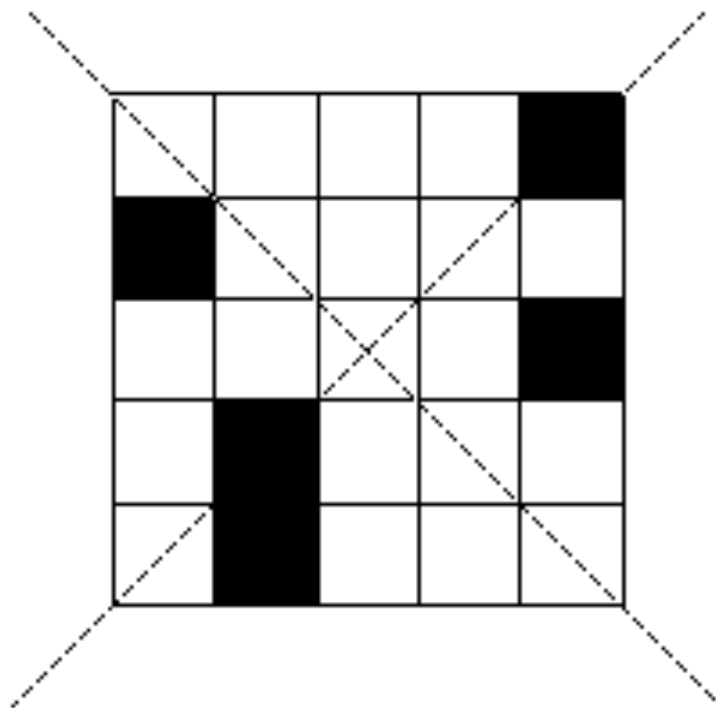# Warmup 2/ (# of characters in "Valentine's Day")

Created by Mr. Lischwe

Continue shading squares until the dotted lines become lines of symmetry for the diagram. **Try to do it so that you shade in the fewest possible squares.**
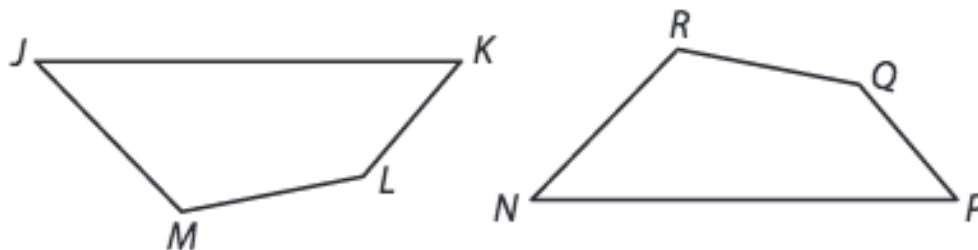
Turn back to page 913!!!

Try B on pg. 913

B Given: Quadrilateral *JKLM* ≅ quadrilateral *NPQR*; ∠*J* ≅ ∠*K*

Prove: ∠*J* ≅ ∠*P*

Statements	Reasons
1. Quadrilateral *JKLM* ≅ quadrilateral *NPQR*	1. Given
2. ∠*J* ≅ ∠*K*	2. Given
3. ∠*K* ≅ ∠*P*	3. Corresponding parts of congruent figures are congruent.
4. ∠*J* ≅ ∠*P*	4. Transitive Property of Congruence

Properties of Equality	
Reflexive Property of Equality	$a = a$
Symmetric Property of Equality	If $a = b$ then $b = a$
Transitive Property of Equality	If $a = b$ and $b = c$ then $a = c$

Highlight pg. 911

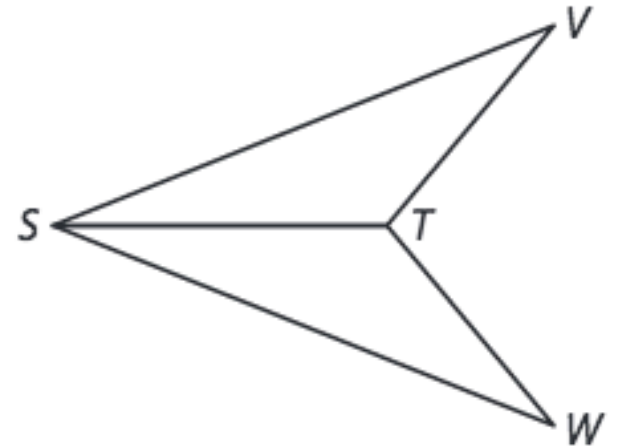| Properties of Congruence	
Reflexive Property of Congruence	$\overline{AB} \cong \overline{AB}$
Symmetric Property of Congruence	If $\overline{AB} \cong \overline{CD}$, then $\overline{CD} \cong \overline{AD}$.
Transitive Property of Congruence	If $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$, then $\overline{AB} \cong \overline{EF}$.

Now try 8 – 12 on pgs. 913-914

Your Turn

Write each proof.

8. Given: $\triangle SVT \cong \triangle SWT$
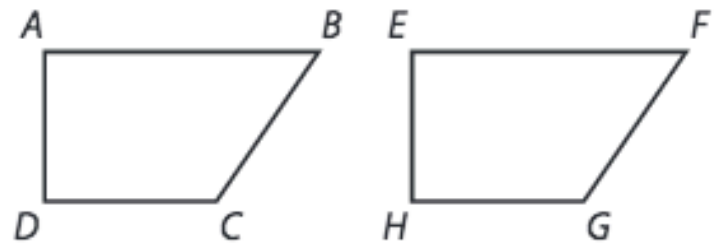   Prove: $\overline{ST}$ bisects $\angle VSW$.

Statements	Reasons
1. $\triangle SVT \cong \triangle SWT$	1. Given
2. $\angle VST \cong \angle WST$	2. Corresponding parts of congruent figures are congruent.
3. $\overline{ST}$ bisects $\angle VSW$.	3. Definition of angle bisector.

9. Given: Quadrilateral $ABCD \cong$ quadrilateral $EFGH$;
$\overline{AD} \cong \overline{CD}$

Prove: $\overline{AD} \cong \overline{GH}$

Statements	Reasons
1. Quadrilateral $ABCD \cong$ quadrilateral $EFGH$	1. Given
2. $\overline{AD} \cong \overline{CD}$	2. Given
3. $\overline{CD} \cong \overline{GH}$	3. Corresponding parts of congruent figures are congruent.
4. $\overline{AD} \cong \overline{GH}$	4. Transitive Property of Congruence

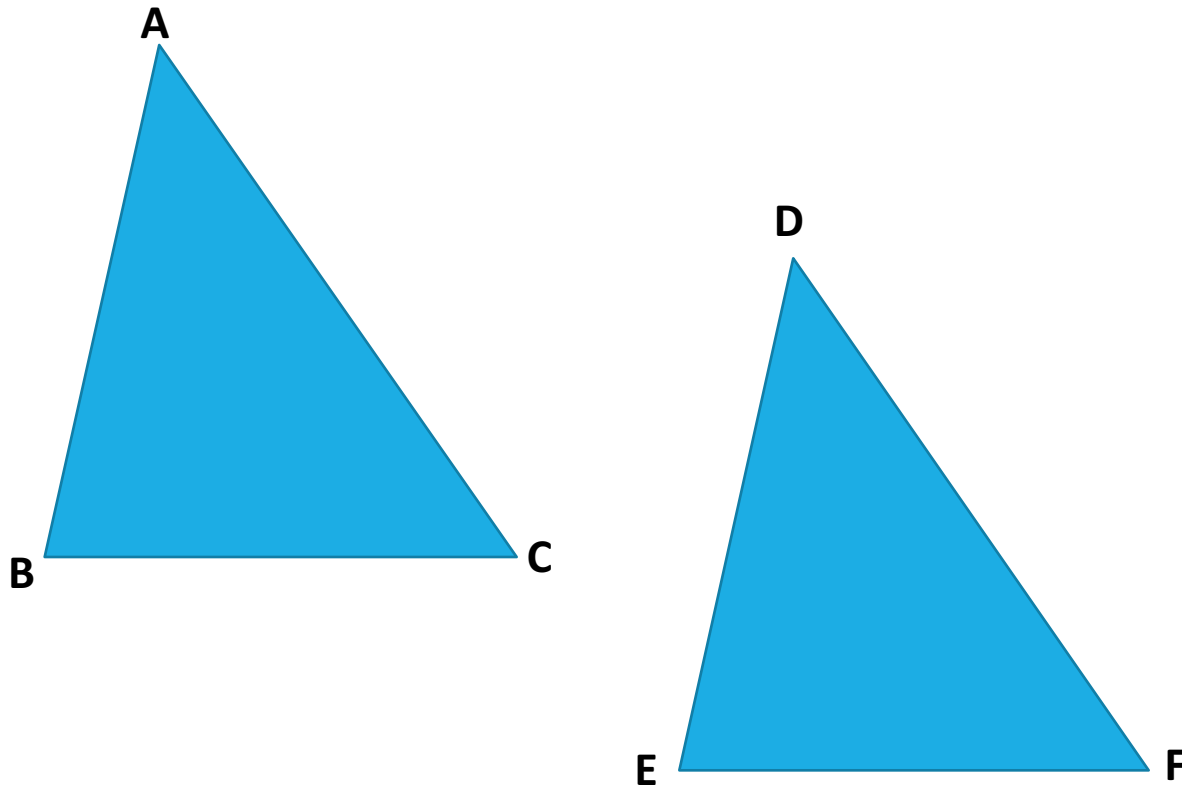# TABLE OF CONTENTS: 2ND SEMESTER

Objective: Explore Triangle Congruence

WHEN WILL TWO TRIANGLES BE CONGRUENT???

Remember:
Rigid Motions and Congruence

Based on what we have learned so far, what do you need to know in order to be able to say that these two triangles are congruent?

Remember:
What does congruent mean?

Two figures are congruent if they have all of the same side lengths and angle measures.

Remember: What are tick marks? Arc Marks?

Sticks Activity!

Using one red stick, one purple stick, and one yellow stick, snap together a triangle.

Now try to make another triangle with the same three colored sticks that is NOT congruent to the first triangle

Reflection Questions

Do you think it is possible to make two triangles that have the same side lengths but are not congruent? Why or why not?

Complete the following conjecture based on your results:
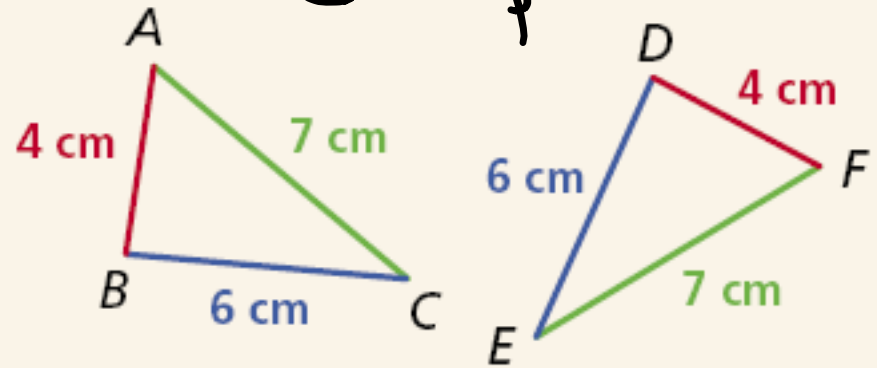
Two triangles are congruent if

_____

What about quadrilaterals?

SSS (Side-Side-Side) Congruence
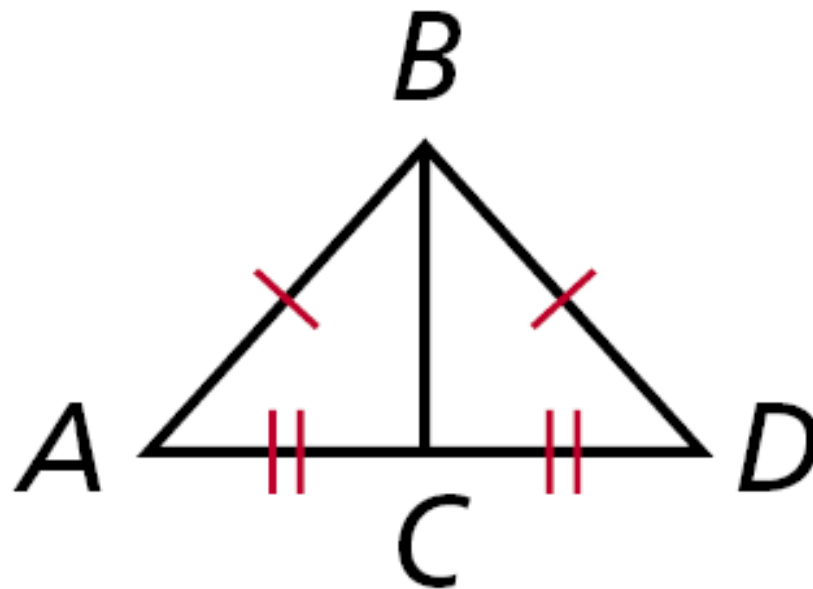
Definition

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

Example

$$\triangle ABC \cong \triangle FDE$$
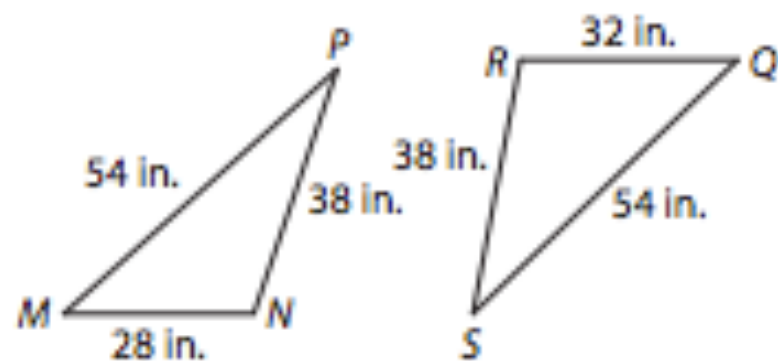
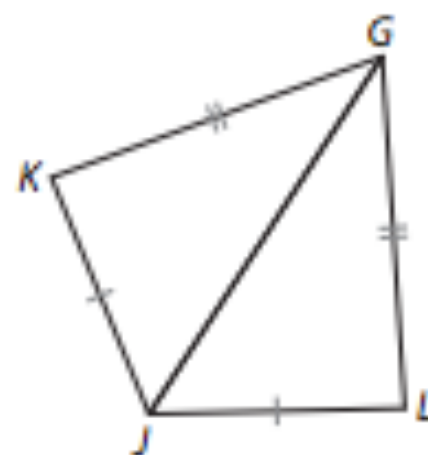# Example of SSS Congruence

Which rigid motion???

Prove that the triangles are congruent or explain why they are not congruent.

5.

54 in. 38 in. 28 in. 32 in. 38 in. 54 in.

P, *M*, *N*, *R*, *Q*, *S*

6.

G, *K*, *L*, *J*

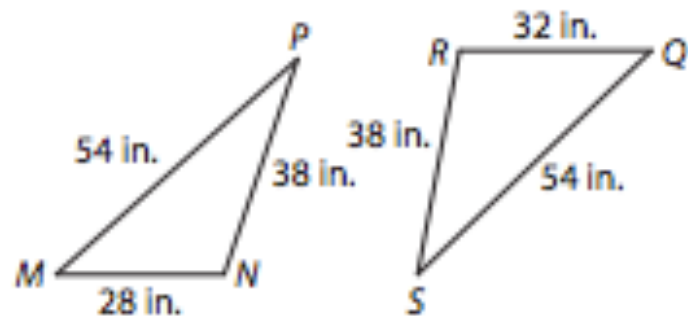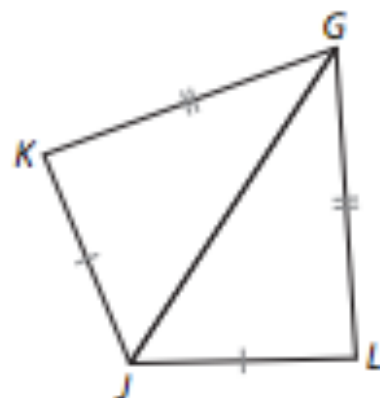**Prove that the triangles are congruent or explain why they are not congruent.**

5.

6.

The corresponding sides $\overline{MN}$ and $\overline{QR}$ are not congruent. Therefore, the triangles are not congruent.

It is given that $\overline{GK} \cong \overline{GL}$ and $\overline{JK} \cong \overline{JL}$, and $\overline{GJ} \cong \overline{GJ}$ by the Reflexive Property.

Sticks Activity Part Two!

Using one red stick and one yellow stick-snap them together with the protractor at 60 degrees. Without changing the angle at which the red stick and the yellow stick are to each other, fill in the missing side length with another color stick. Is there only one possible way to do this?

Reflection Questions

Suppose you know two side lengths of a triangle and the measure of the angle between these sides. Can the length of the third side be any measure? Explain.

Complete the following conjecture based on your results:
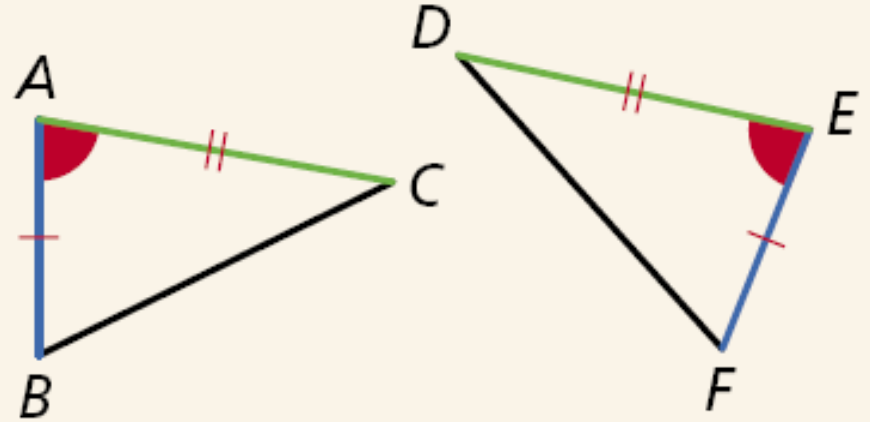
Two triangles are congruent if

_____
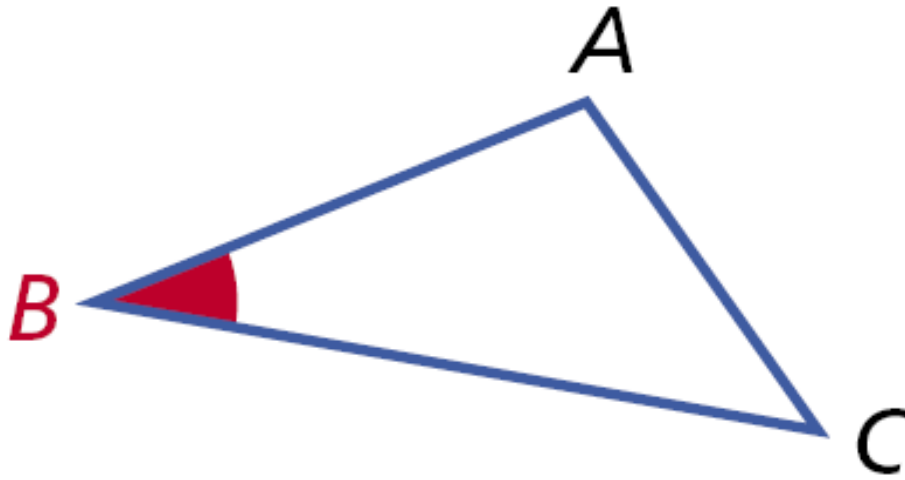
An **<u>included angle</u>** is an angle formed by two adjacent sides of a polygon. $\angle B$ is the included angle between sides $\overline{AB}$ and $\overline{BC}$.

SAS Congruence

Exemple

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.
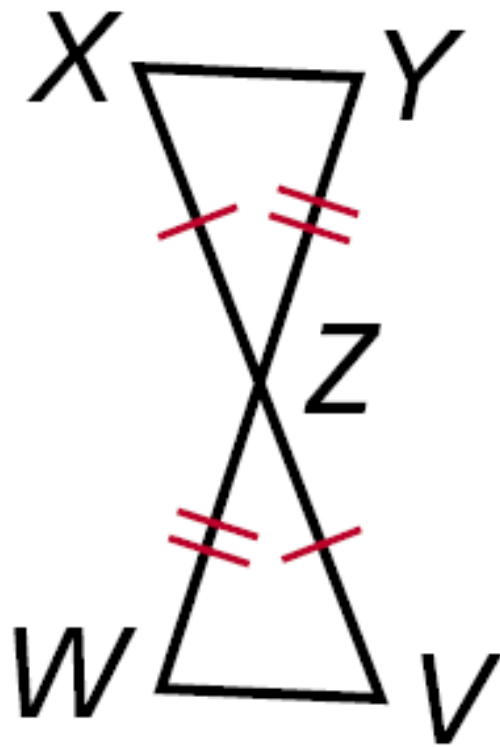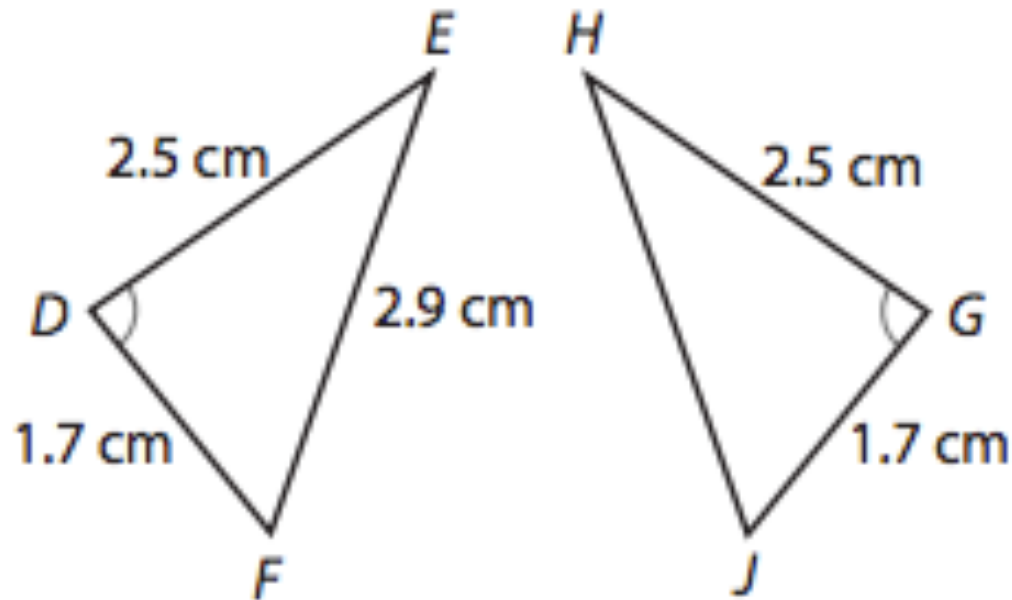
$\triangle ABC \cong$

The letters SAS are written in that order because the congruent angles must be between pairs of congruent corresponding sides.

Example of SAS Congruence
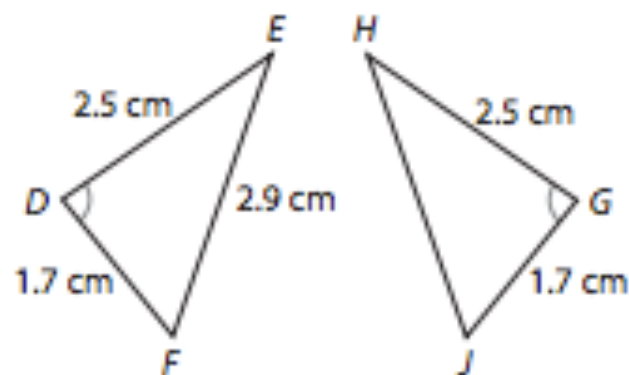
Which rigid motion???

Are the triangles congruent? Explain your reasoning.

3. Determine whether the triangles are congruent. Explain your reasoning.

$\overline{DE} \cong \overline{GH}$, $\overline{DF} \cong \overline{GJ}$, and $\angle D \cong \angle G$, and $\angle D$ and $\angle G$ are included by congruent corresponding sides. $\triangle EDF \cong \triangle HGJ$ by the SAS Triangle Congruence Theorem.

Homework

SSS pg. 1033 (10-14)

SAS pg. 1020 (2-7)