Geometry
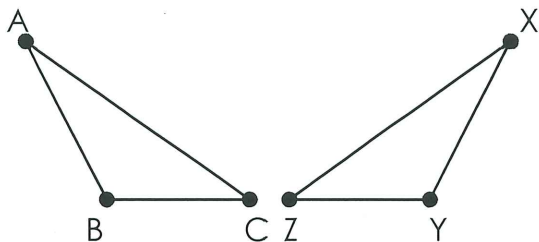**Notes:** Triangle Congruence (SSS & SAS)
Textbook: Lesson 4-4, page 264 - 272
Homework:

Essential Question: What are the similarities and differences between the five congruence postulates and theorems?

In a previous lesson, we showed how triangles are congruent according to the *definition of congruent triangles*. If △ABC ≅ △XYZ, what else do we know?

However, there ways to know whether or not two triangles are congruent with less information than all 6 pairs of corresponding parts. When working with 3 measurements (angles, or sides, or a combination of the two), there are 6 possible arrangements:

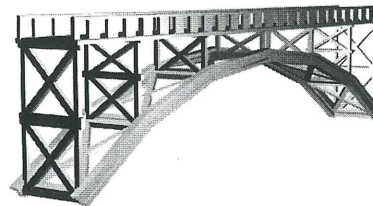| Side-Side-Side	Side-Angle-Side	Side-Side-Angle
Angle-Side-Angle	**Angle-Angle-Side**	**Angle-Angle-Angle**

Two of these arrangements of congruent corresponding parts will not guarantee that triangles are congruent: _____ and _____. The other four arrangements of measurements and a special theorem for right triangles *will* guarantee that triangles are congruent.

Side-Side-Side Congruence Postulate (SSS ≅ Postulate): If _____ sides of one triangle are congruent with three _____ of another triangle, then the triangles are _____.
   Diagram:
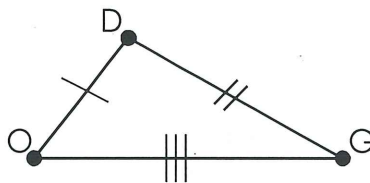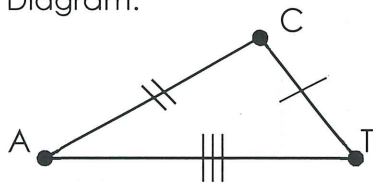
The SSS ≅ Postulate shows why triangles are used when constructing buildings, bridges, and even bookshelves. Three given side lengths **cannot** create more than one possible triangular shape. So, when a structure is composed of triangles, it **cannot** change its shape. For this reason, a triangle is known as a **rigid shape**.
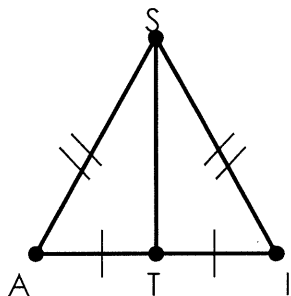
Side-Angle-Side Congruence Postulate (SAS ≅ Postulate): If two sides and the _____ angle of one triangle are congruent with _____ sides and the included angle of another triangle, then the triangles are congruent.
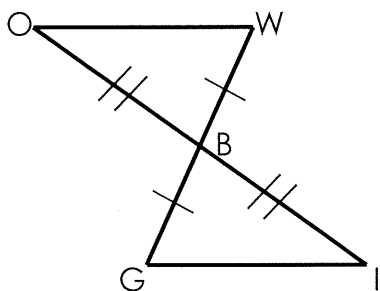
Diagram:
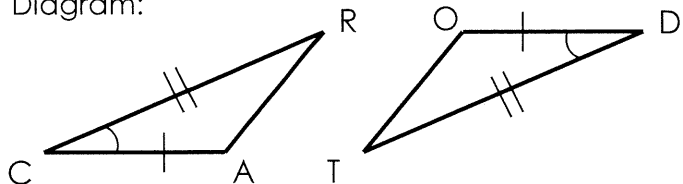
Examples: Determine whether the congruence statement is true based on the given figure. *Explain* your reasoning.
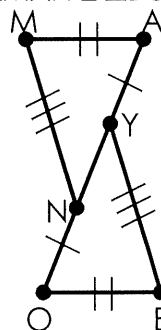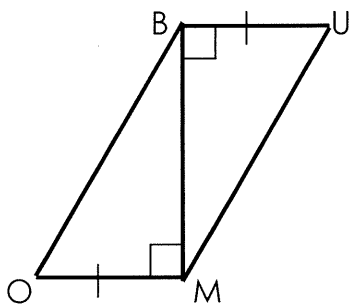
a. △SAT ≅ △SIT

b. △BOW ≅ △BIG

c. △MAN ≅ △BOY

d. △BUM ≅ △MOB

e. △BAT ≅ △RAT
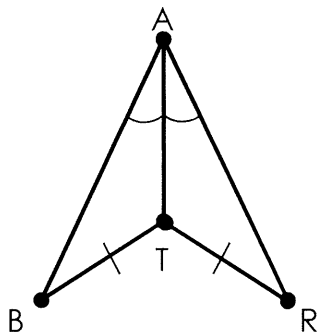
f. △SEA ≅ △WET

Name:_____

Given: $\overline{AB} \cong \overline{AC}, \overline{BD} \cong \overline{CD}$, $\angle B \cong \angle C$, $\angle BAD \cong \angle CAD$
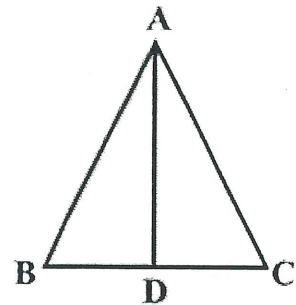
Prove: $\triangle ABD \cong \triangle ACD$

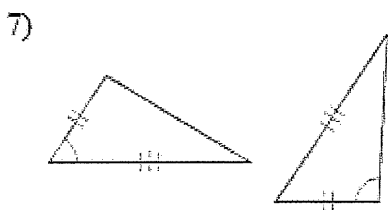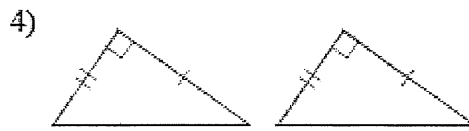| Statements	Reasons
$\overline{AB} \cong \overline{AC}$, $\overline{BD} \cong \overline{CD}$	
	Reflexive Property
	Given
$\angle BDA \cong \angle CDA$	
	Definition of Congruent Triangles

Name:_____
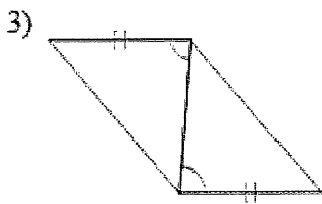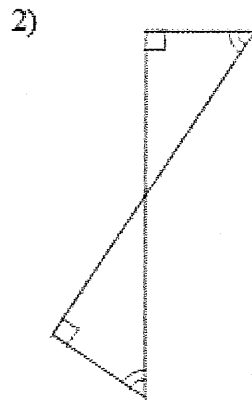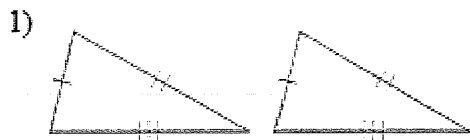
Given: $\overline{AB} \cong \overline{AC}, \overline{BD} \cong \overline{CD}$, $\angle B \cong \angle C$, $\angle BAD \cong \angle CAD$

Prove: $\triangle ABD \cong \triangle ACD$

| Statements	Reasons
$\overline{AB} \cong \overline{AC}$, $\overline{BD} \cong \overline{CD}$	
	Reflexive Property
	Given
$\angle BDA \cong \angle CDA$	
	Definition of Congruent Triangles

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

1)

2)

3)

4)

5)

6)

7)

8)

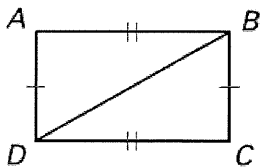9)

10)

Name _____ Date _____ Period _____
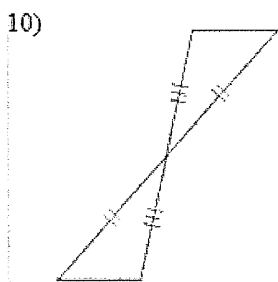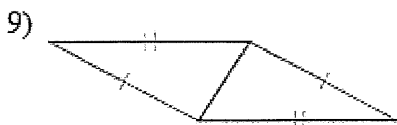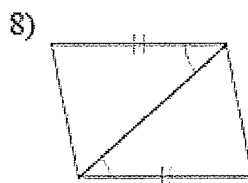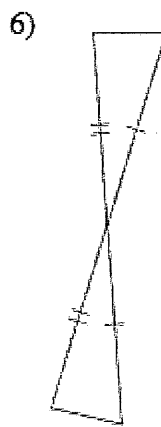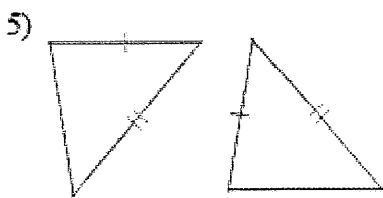
Geometry
SSS and SAS - Triangle Congruence Homework

Determine if the triangles are congruent. If they are (1) state the postulate used and (2) write a congruence statement. If not, explain why.
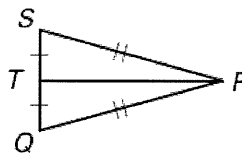
1.

2.

3.

4.

5.

6.
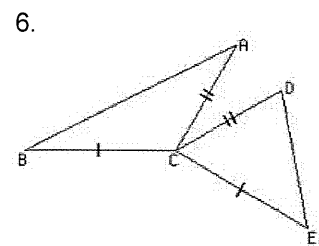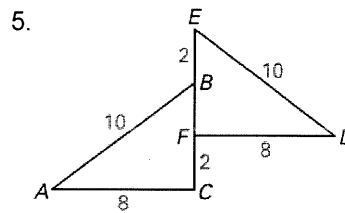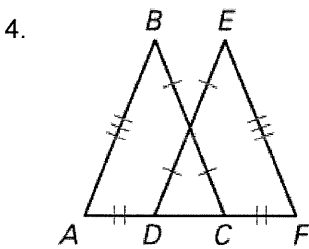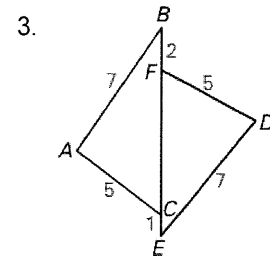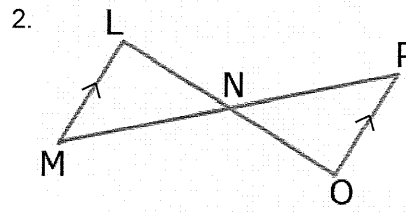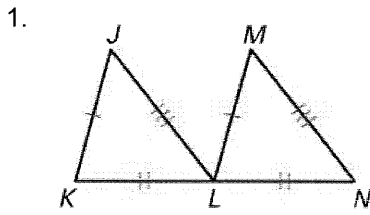
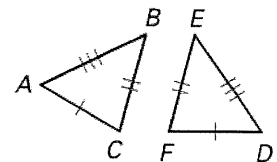**Determine if the given congruence statement is correct. If it is not, correct it.**
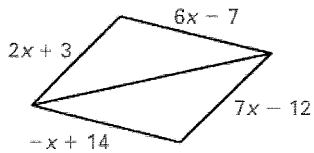
7. $\triangle ABD \cong \triangle CDB$

8. $\triangle RST \cong \triangle RQT$

9. $\triangle ABC \cong \triangle DEF$

10. Determine all values of x that would make the 2 triangles congruent. Explain.

$6x - 7$
$2x + 3$
$7x - 12$
$-x + 14$

11. Mrs. Gibbons is making a sandwich for her two twin girls. She uses 2 rectangular pieces of bread to make one sandwich and then cuts along the diagonal. Are the two triangular sandwiches congruent? Explain.

Use the diagram to name the included angle between the given pair of sides.

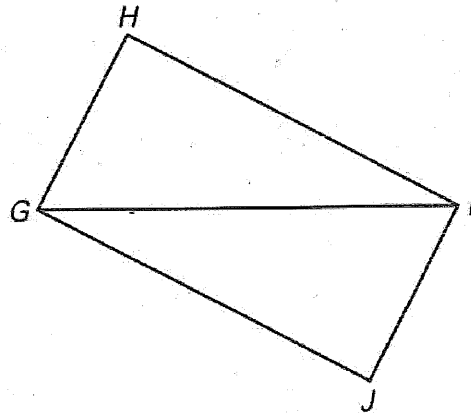1. $\overline{GH}$ and $\overline{HI}$

2. $\overline{HI}$ and $\overline{IG}$

3. $\overline{IG}$ and $\overline{HG}$

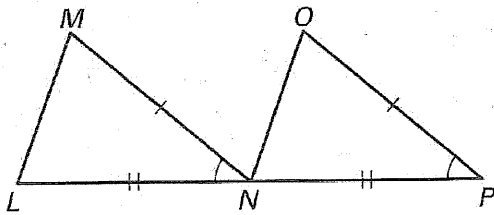4. $\overline{GI}$ and $\overline{IJ}$

5. $\overline{JG}$ and $\overline{IG}$
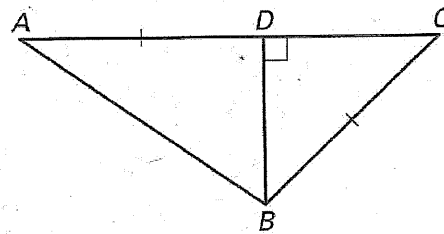
6. $\overline{IJ}$ and $\overline{GJ}$

Decide whether enough information is given to prove that the triangles are congruent using the SAS Congruence Postulate.
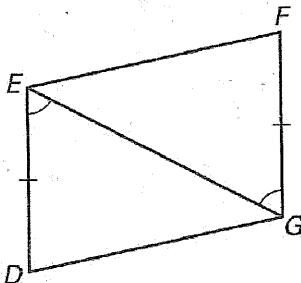
7. $\triangle LMN$, $\triangle NOP$

8. $\triangle ABD$, $\triangle CBD$

9. $\triangle DEG$, $\triangle FGE$

10. $\triangle RST$, $\triangle VUT$