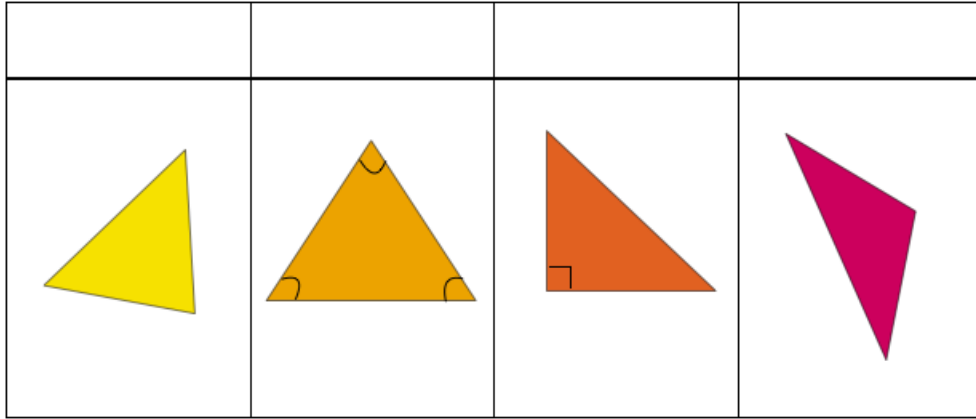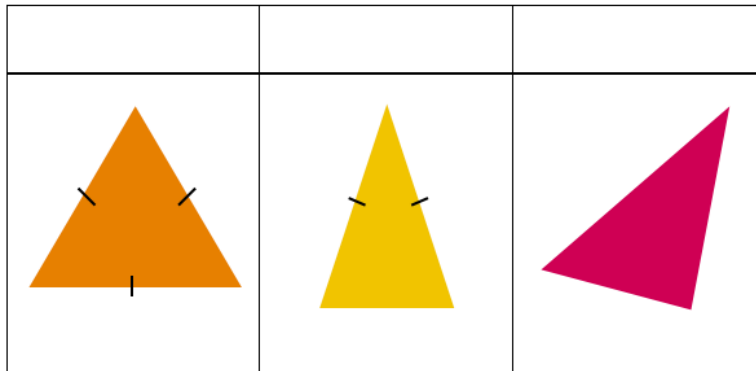Name _____

Date _____ Period _____

Chapter 5 Congruent Triangles
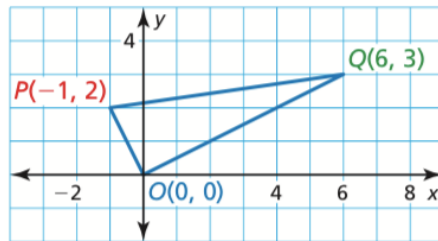
Ch 5.1 Angles of Triangles
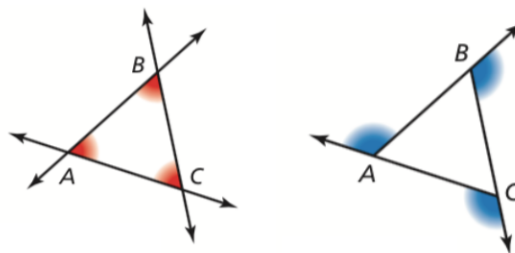
Classification by Angle Measure

Classification by Side Measure

Classify the Triangle
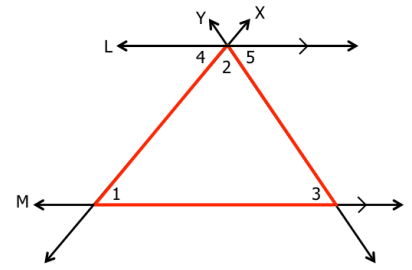
Angles of the Triangle

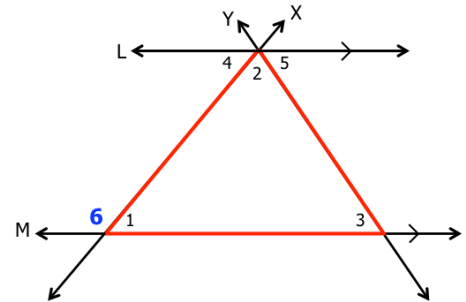What is $m\angle 1 + m\angle 2 + m\angle 3$? And why?

Triangle Sum Theorem	

Solve
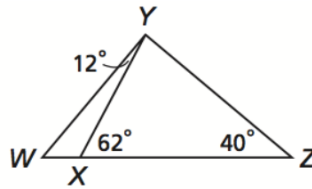
Find $m\angle XYZ$

$m\angle YWZ$

What is the measure of angle 6?

Exterior Angle Theorem	

$m\angle 1 = m\angle A + m\angle B$
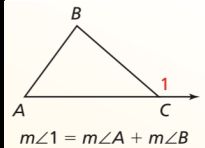
Practice:

a) Solve for $m\angle 3$ if $m\angle 2 = 6x - 1$ and $m\angle 6 = 126°$
and $m\angle 3 = 5x + 17$

b) Solve for $m\angle 1$
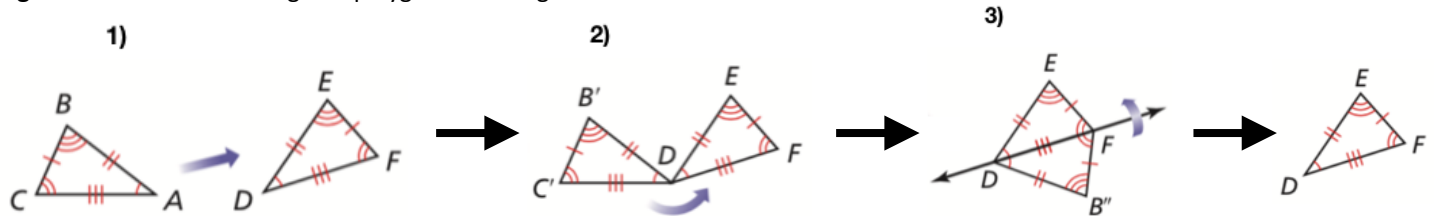
$3x°$

$40°$ $(5x - 10)°$
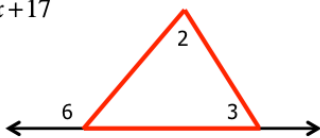
Ch 5.2 Congruent Polygons

Vocabulary

Congruent Figures: _____

Rigid Motion Proof: Proving two polygons are congruent.
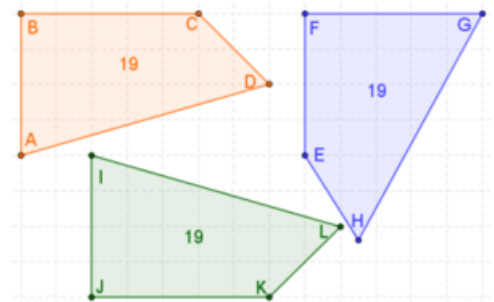

Properties of congruent polygons

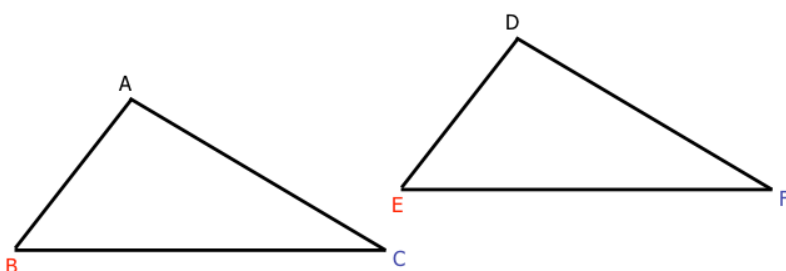Two polygons are congruent when:

1. _____

2. _____

For the diagram on the right:

$ABCD \cong$

For the figures below, suppose you are given that $\triangle ABC \cong \triangle DEF$. What do you automatically know?

Given: The two triangles are congruent

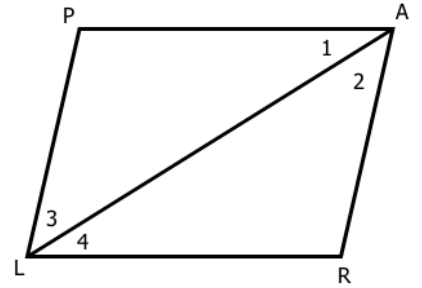a. $\triangle PAL \cong$ _____

b. $\overline{PA} \cong$ _____

c. $\angle 1 \cong$ _____ because _____

   Then $\overline{PA} \parallel$ _____ because _____
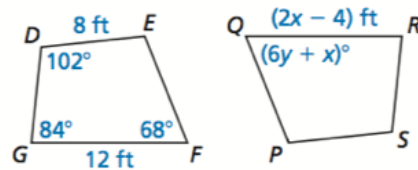
d. $\angle 2 \cong$ _____ because _____

   Then _____ $\parallel$ _____ because _____
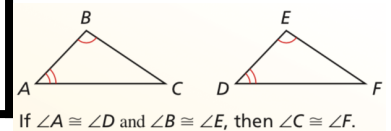
In the diagram, $DEFG \cong SPQR$.

a. Find the value of x.

b. Find the value of y.
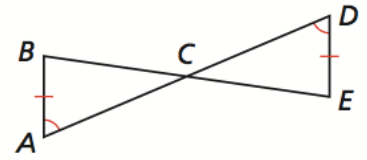
Properties of Triangle Congruence

Reflexive	
Symmetric	
Transitive	

Third Angles Theorem	

If $\angle A \cong \angle D$ and $\angle B \cong \angle E$, then $\angle C \cong \angle F$.

Given $\overline{AD}$ bisects $\overline{BE}$, $\overline{BE}$ bisects $\overline{AD}$
Prove: the two triangles are congruent

Statements   Reasons
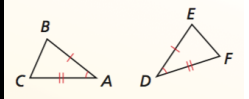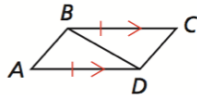
Ch 5.3 Proving Triangle Congruence by SAS

Side-Angle-Side (SAS) Congruence Theorem	

Prove:

Given: $\overline{BC} \parallel \overline{AD}$, $\overline{BC} \cong \overline{AD}$
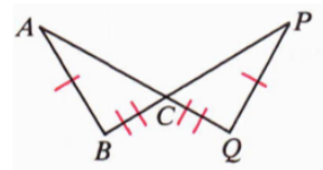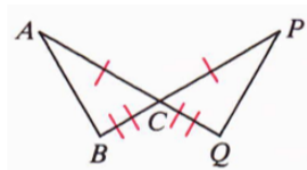**Prove:** $\triangle ABD \cong \triangle CDB$

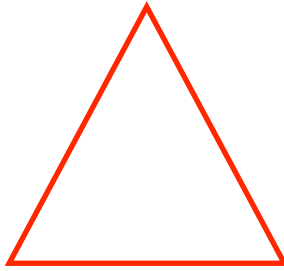Statements   Reasons

Which are congruent, and why or why not?

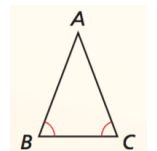## Ch 5.4 Equilateral and Isosceles Triangles

Isosceles Triangle

List the triangle parts.
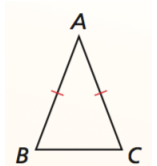
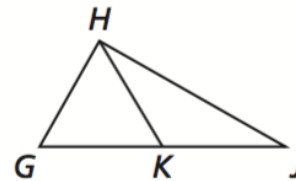| **Base Angles Theorem**		
Converse of the Base Angles Theorem		

Complete the statements using the figure to the right.

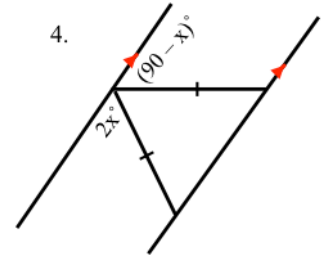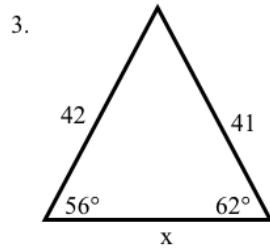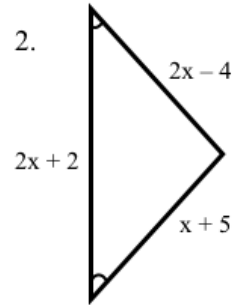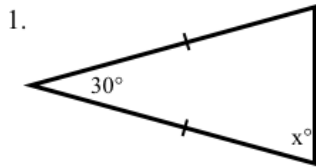1. If $\overline{HG} \cong \overline{HK}$, then $\angle$_____ $\cong$ $\angle$_____

2. If $\angle KHJ \cong \angle KJH$, then _____ $\cong$ _____

Corollary to Base Angles Theorem	
Corollary to the Converse of the Base Angles Theorem	

Solve for x.

1.

30°

x°

2.

$2x - 4$

$2x + 2$

$x + 5$

3.

42   41

56°   62°

x

4.

$(90 - x)°$

$2x°$

Ch 5.5 Proving Triangle Congruence by SSS

Side-Side-Side (SSS) Congruence Theorem	

B

E

C   A   D   F
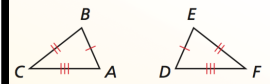
Prove:

Given $\overline{KL} \cong \overline{NL}$, $\overline{KM} \cong \overline{NM}$

Prove $\triangle KLM \cong \triangle NLM$

L

K   N
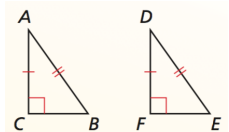
M
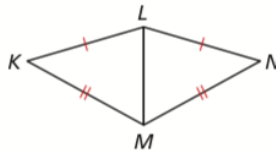
Statements   Reasons

Determine if ΔABC and ΔDEF are congruent using SSS. If so, write their congruence statement.

1) A(−2, −2), B(4, 6), C(4, −2), D(5, 7), E(5, 1), F(13, 1)

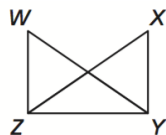2) A(9, 0), B(0, 0), C(6, 5), D(0, −1), E(6, −6), F(9, −1)

Hypotenuse-Leg (HL) Congruence Theorem	

Prove:

Given $\overline{WY} \cong \overline{XZ}, \overline{WZ} \perp \overline{ZY}, \overline{XY} \perp \overline{ZY}$

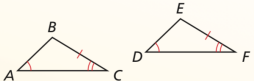**Prove** $\triangle WYZ \cong \triangle XZY$

<u>Statements</u>	<u>Reasons</u>

Ch 5.6 Proving Triangle Congruence by ASA and AAS

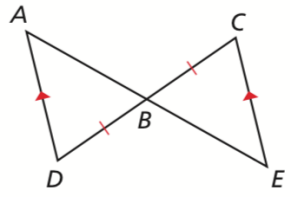| Angle-Side-Angle (ASA) Congruence Theorem		
Angle-Angle-Side (AAS) Congruence Theorem		

Which are congruent and why?
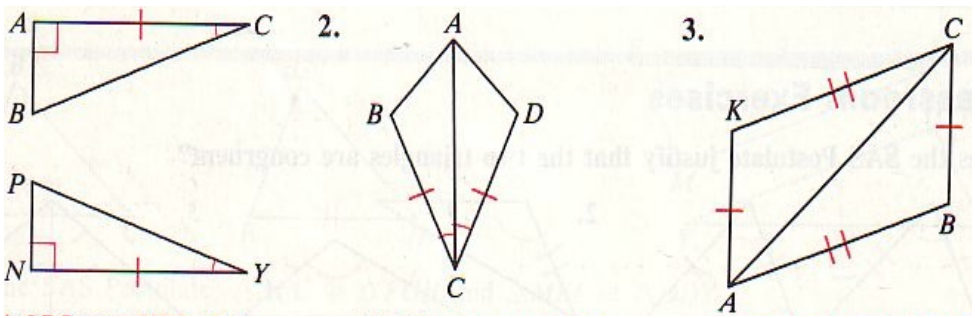
Prove:

Given $\overline{AD} \parallel \overline{EC}$, $\overline{BD} \cong \overline{BC}$

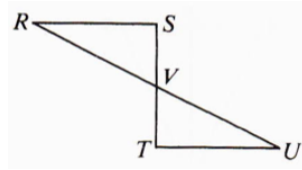**Prove** $\triangle ABD \cong \triangle EBC$

Statements	Reasons

Prove:

Given: $\overline{RS} \perp \overline{ST}$; $\overline{TU} \perp \overline{ST}$
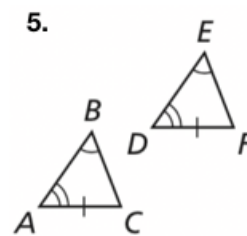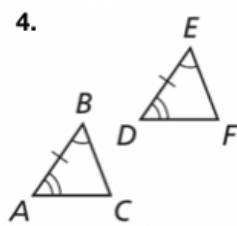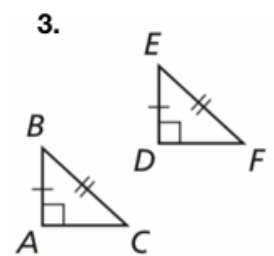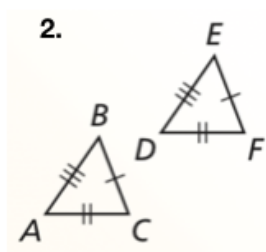   V is the midpoint of ST

Prove: $\triangle RSV \cong \triangle UTV$

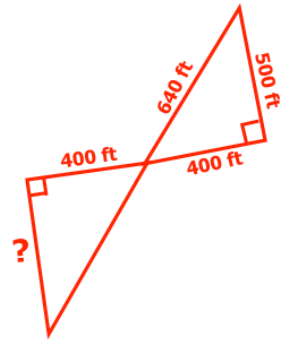| Statements	Reasons

Summary of Triangle Congruence Theorems

1.

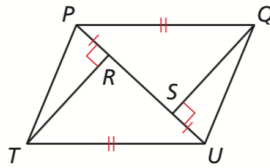
2.

3.

4.

5.
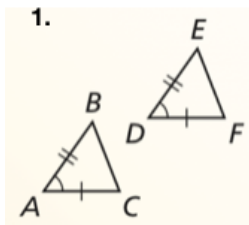
Ch 5.7 Using Congruent Triangles

In this chapter, if we prove _____ are congruent,

then the _____ must be congruent!

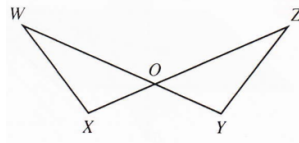This reason is called **CPCTC** which stands for

_____

Write a plan to prove $\triangle PTU \cong \triangle UQP$.

Prove:

Given: $\overline{WO} \cong \overline{ZO}; \overline{XO} \cong \overline{YO}$

Prove: $\angle W \cong \angle Z$

Statements	Reasons

Ch 5.8 Coordinate Proof (skip)