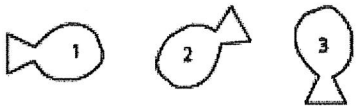
Geometry 4.3a Congruent Triangles **Congruence and Corresponding Parts** Fri (11/13)

Congruent	Not Congruent
	
While positioned differently, Figures 1, 2, and 3 are exactly the same shape and size.	Figures 4 and 5 are exactly the same shape but not the same size. Figures 5 and 6 are the same size but not exactly the same shape.

In two congruent polygons, all parts of one polygon are congruent to the _____ parts or matching parts of another polygon. These *corresponding parts* include *corresponding angles* and *corresponding sides.*

KeyConcept Definition of Congruent Polygons

Words Two polygons are congruent if and only if their corresponding parts are congruent.

Example

Corresponding Angles

$\angle A \cong \angle H$ $\angle B \cong \angle J$ $\angle C \cong \angle K$

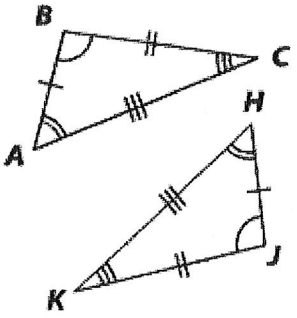
Corresponding Sides

$\overline{AB} \cong \overline{HJ}$ $\overline{BC} \cong \overline{JK}$ $\overline{AC} \cong \overline{HK}$

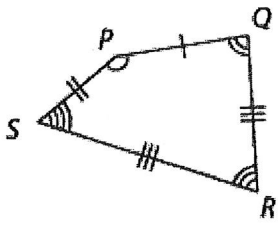
Congruence Statement

$\triangle ABC \cong \triangle HJK$

Model

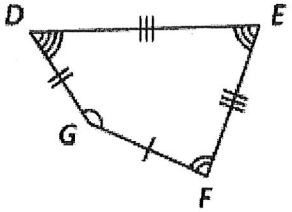


Show that the polygons are congruent by identifying all the congruent corresponding parts. Then write a congruence statement.



Angles: $\angle P \cong \angle G$, $\angle Q \cong \angle F$, $\angle R \cong \angle E$, $\angle S \cong \angle D$

Sides: $\overline{PQ} \cong \overline{GF}$, $\overline{QR} \cong \overline{FE}$, $\overline{RS} \cong \overline{ED}$, $\overline{SP} \cong \overline{DG}$

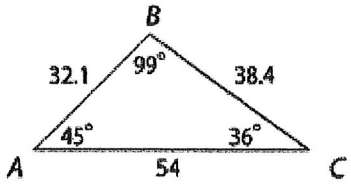


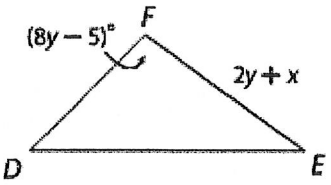
All corresponding parts of the two polygons are congruent. Therefore, polygon $PQRS \cong$ polygon $GFED$.

The phrase "if and only if" in the congruent polygon definition means that both the conditional and its converse are true. So, if two polygons are congruent, then their corresponding parts are congruent. For triangles, we say *Corresponding parts of congruent triangles are congruent*, or CPCTC.

In the diagram, $\triangle ABC \cong \triangle DFE$. Find the values of x and y.

Use Corresponding Parts of Congruent Triangles





$\angle F \cong \angle B$

$m\angle F = m\angle B$

$8y - 5 = 99$

$8y = 104$

$y = 13$

$\overline{FE} \cong \overline{BC}$

$FE = BC$

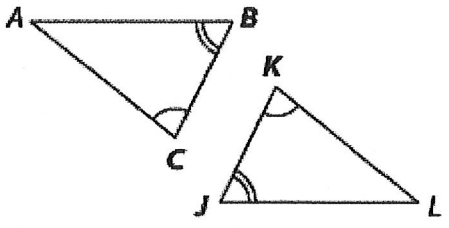
$2y + x = 38.4$

$2(13) + x = 38.4$

$26 + x = 38.4$

$x = 12.4$

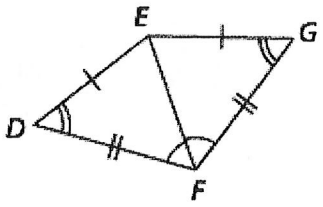
Third Angles Theorem :



Write a two-column proof.

Given: $\overline{DE} \cong \overline{GE}, \overline{DF} \cong \overline{GF}, \angle D \cong \angle G,$
$\angle DFE \cong \angle GFE$

Prove: $\triangle DEF \cong \triangle GEF$



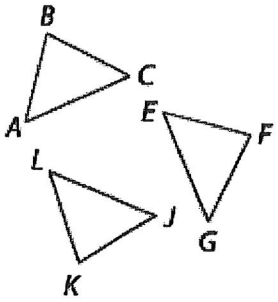
Proof:

Statements	Reasons
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)

Properties of Triangle Congruence:

Reflexive Property of Congruence –

Symmetric Property of Congruence –



Transitive Property of Congruence –

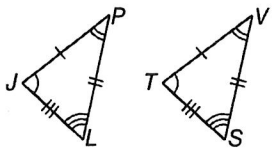
NAME _____ DATE _____ PERIOD _____

4-3 Skills Practice

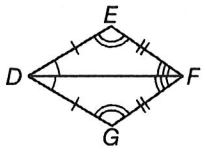
Congruent Triangles

Show that polygons are congruent by identifying all congruent corresponding parts. Then write a congruence statement.

1.



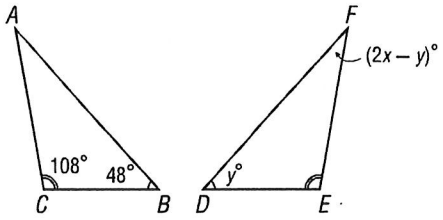
2.



In the figure, $\triangle ABC \cong \triangle FDE$.

3. Find the value of x.

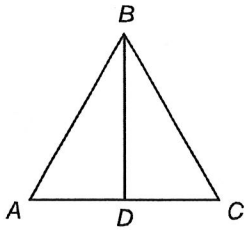
4. Find the value of y.



5. PROOF Write a two-column proof.

Given: $\overline{AB} \cong \overline{CB}, \overline{AD} \cong \overline{CD}, \angle ABD \cong \angle CBD, \angle ADB \cong \angle CDB$

Prove: $\triangle ABD \cong \triangle CBD$



Statements	Reasons
1)	1) Given
2)	2) Given
3)	3)
4)	4)

Lesson 4-3