

Name:

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2

Congruent Polygons and Corresponding Parts

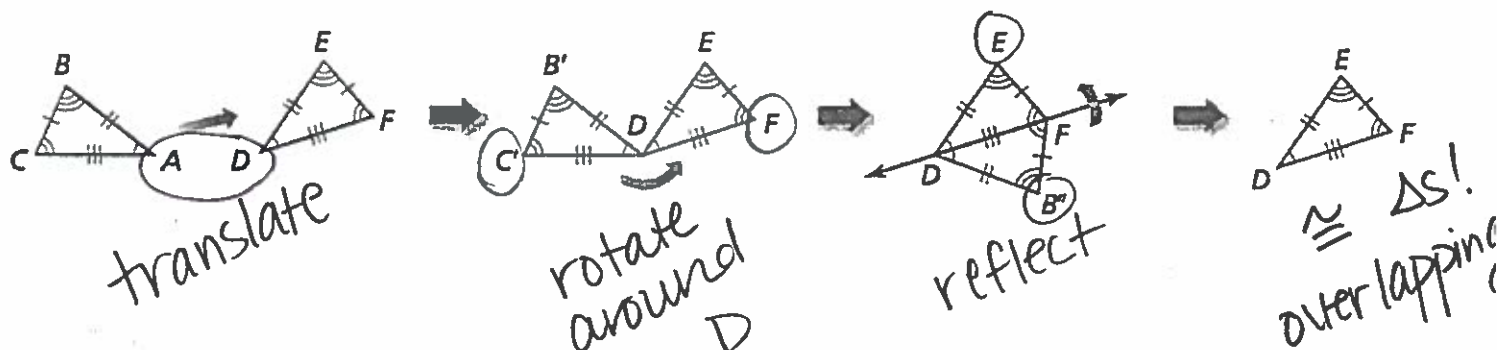
Lesson Objective: IWBAT identify and use $\cong$ corresponding parts of figures to prove 2 figures are $\cong$

Remember: Two figures are congruent if and only if a rigid motion or a composition of rigid motions maps each part of a figure onto the other.

→ A rigid motion maps each part of a figure to a **corresponding part** of its image.

→ Because rigid motions preserve length and angle measure, corresponding parts of congruent figures are congruent. This means that corresponding sides and corresponding angles are $\cong$.

Using Rigid Motions to prove two figures are congruent

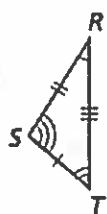
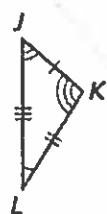


Now that we know the two triangles above are congruent, we can write a congruency statement

$$\triangle ABC \cong \triangle DEF \quad (\text{OR } \triangle BAC \cong \triangle E D F)$$

Example:

1. Write a congruence statement for the triangles. Identify all parts of congruent, corresponding parts.



$$\triangle JKL \cong \triangle RST$$

$$\angle J \cong \angle R$$

$$\angle L \cong \angle S$$

$$\angle K \cong \angle T$$

$$\overline{JK} \cong \overline{KL}$$

$$\overline{RS} \cong \overline{ST}$$

$$\overline{JR} \cong \overline{LT}$$

2. In the diagram, $\triangle DEF \cong \triangle RSP$.

a. Find the value of x.

$$12 = 2x - 4$$

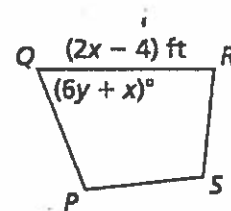
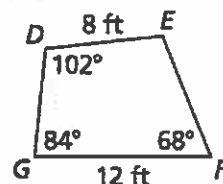
$$\boxed{x = 8}$$

b. Find the value of y.

$$68^\circ = 6y + x$$

$$68 = 6y + 8$$

$$\boxed{y = 10}$$

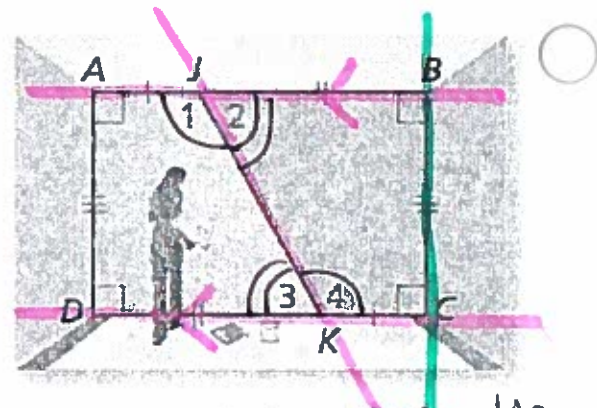


Showing That Figures are Congruent

Example:

3. You divide the wall into orange (left) and blue (right) sections along $\overline{JK}$. Will the sections of the wall be the same size and shape? Explain.

given $\begin{cases} \overline{AJ} \cong \overline{CK}, \overline{KD} \cong \overline{JB}, \overline{AD} \cong \overline{CB} \\ \angle A \cong \angle C, \angle D \cong \angle B \end{cases}$



* $\overline{JK} \cong \overline{KJ}$: reflex. prop. $\cong$

* $\overline{AB} \parallel \overline{CD}$: if consec. int. $\rightarrow \parallel$
LS supp

* $\angle 1 \cong \angle 4$: if $\parallel \rightarrow$ alt. int. $\angle s \cong$

* $\angle 2 \cong \angle 3$: " " $\rightarrow$ " " " "

yes, they are the same size and shape since all corresp. $\angle s$ and sides are $\cong$

Properties of Triangle Congruence

Reflexive: for any $\Delta 1$, $\Delta 1 \cong \Delta 1$

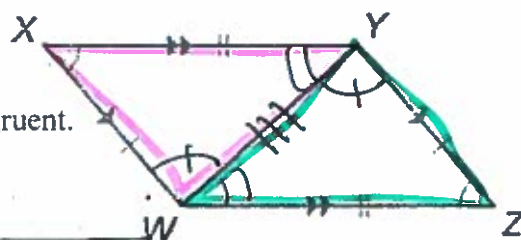
Symmetric: if $\Delta 1 \cong \Delta 2$, then $\Delta 2 \cong \Delta 1$

Transitive: if $\Delta 1 \cong \Delta 3$ and $\Delta 3 \cong \Delta 2$, then $\Delta 1 \cong \Delta 2$

Proving that Triangles are Congruent

Example:

4. Use the information in the figure to prove that the triangles are congruent.



Statements	Reasons
① $\overline{XW} \cong \overline{ZY}$ $\overline{XY} \parallel \overline{ZW}$	① given
$\overline{XZ} \cong \overline{XZ}$ $\overline{XW} \parallel \overline{ZY}$	
$\angle X \cong \angle Z$	
② $\overline{WZ} \cong \overline{ZY}$	② reflex. prop. $\cong$
③ $\angle XWZ \cong \angle ZYX$	③ if $\parallel \rightarrow$ alt. int. $\angle s \cong$
④ $\angle XWZ \cong \angle ZYX$	④ " " $\rightarrow$ " " " "
⑤ $\Delta XWZ \cong \Delta ZYX$	⑤ all corresp. parts are $\cong$