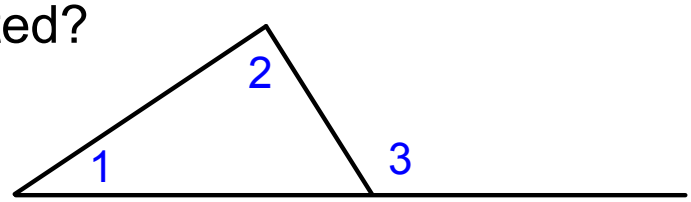
Bellwork:

How and why are the angles related?



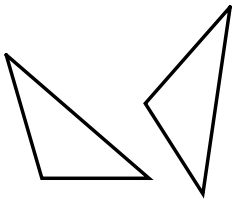
$m\angle 3 = m\angle 1 + m\angle 2$

by exterior angle Thm.

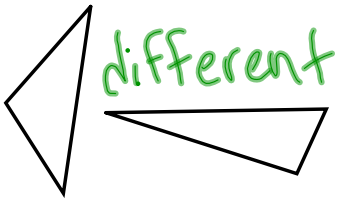
Chapter 4.2: Apply Congruence and Triangles

same shape & size

Congruent



Not Congruent

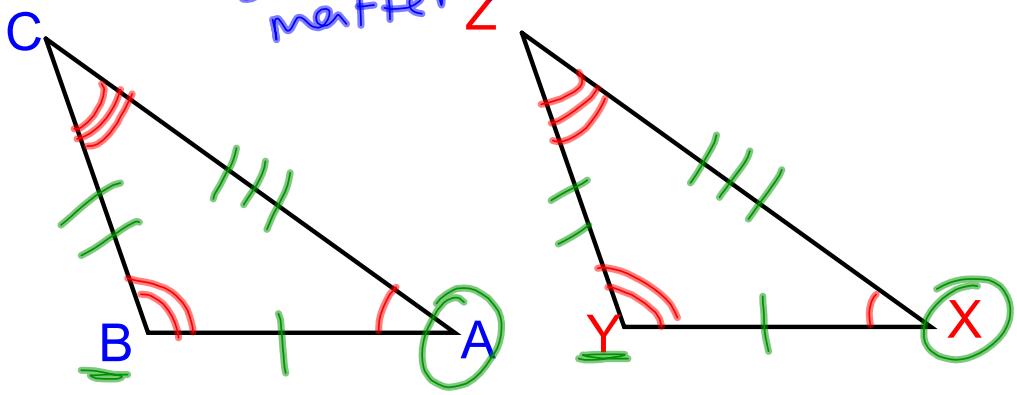


Figures that are congruent have congruent corresponding parts.

CPCTC - Corresponding Parts of congruent Triangles are congruent!

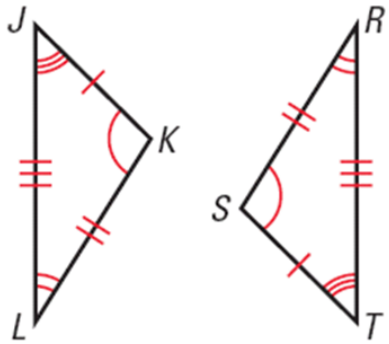
If $\Delta ABC \cong \Delta XYZ$ Then....

order matters



use tick marks to show $\cong$

ex. Write a congruence statement from the picture and list the corresponding parts.



$\Delta JKL \cong \Delta TSR$

$\angle J \cong \angle T$

$\angle R \cong \angle L$

$\angle S \cong \angle K$

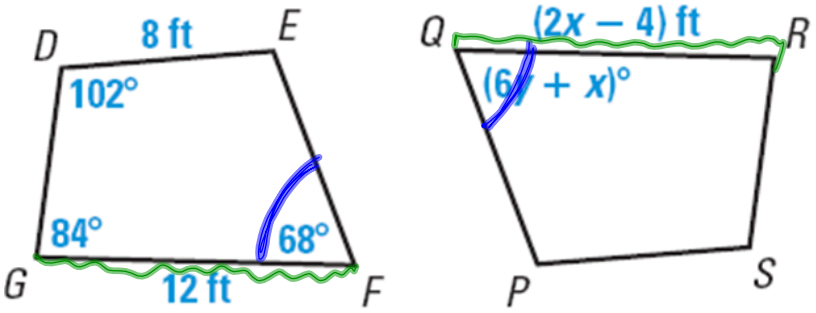
$\overline{RS} \cong \overline{LK}$

$\overline{ST} \cong \overline{JK}$

$\overline{RT} \cong \overline{JL}$

ex. In the diagram, DEFG SPQR

-Find the value of x and y.



$6y + 8 = 68$ → $-8 \quad -8$

$\frac{6y}{6} = \frac{60}{6}$

$y = 10$

$12 = 2x - 4$

$+4 \quad +4$

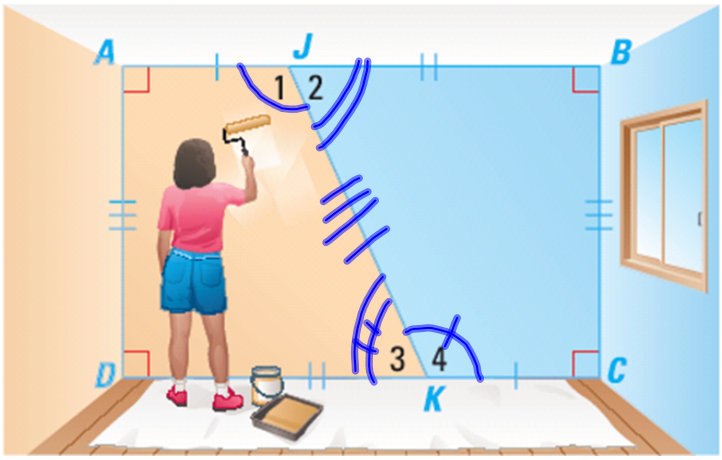
$\frac{16}{2} = \frac{2x}{2}$

$x = 8$

ex. If you divide the wall into orange and blue sections along $\overline{JK}$, will the sections of the wall be the same size and shape? Explain.

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

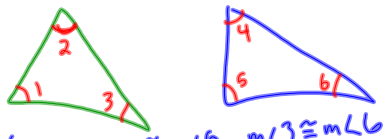
$a = b$, $b = a$



Theorem 4.3: Third Angles Theorem

If two angles of one triangle are congruent to two angles of another triangle, then the third angles are also congruent.

WHY???? PICTURE??? PROOF...

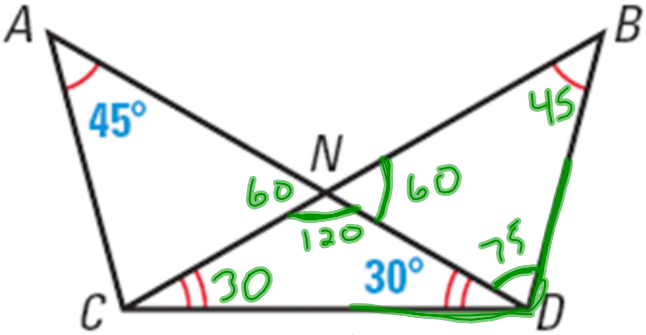


Given: $m\angle 1 \cong m\angle 5$, $m\angle 3 \cong m\angle 6$

Prove: $m\angle 2 = m\angle 4$

$m\angle 1 \cong m\angle 5$, $m\angle 3 \cong m\angle 6$	Given
$m\angle 1 + m\angle 2 + m\angle 3 = 180$	$\rightarrow$ Tri. Sum. Thm
$m\angle 4 + m\angle 5 + m\angle 6 = 180$	$\rightarrow$ Tri. Sum. Thm.
$m\angle 1 + m\angle 2 + m\angle 3 = m\angle 4 + m\angle 5 + m\angle 6$	Transitive
$m\angle 5 + m\angle 2 + m\angle 6 = m\angle 4 + m\angle 5 + m\angle 6$	Substitution
$m\angle 2 = m\angle 4$	$\rightarrow$ subtraction Prop of =.
$\angle 2 \cong \angle 4$	Def of. $\cong$

ex. Find m<BDC



180 − 60 = 120

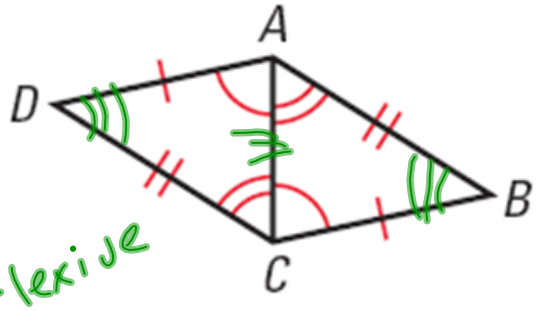
180 − 45 = 135

30 + 75 = 105°

ex. Write a proof

Given: $\overline{AD}$ $\overline{CB}$, $\overline{DC}$ $\overline{BA}$, <ACD <CAB, <CAD <ACB

Prove: ΔACD ΔCAB



$\overline{AC} \cong \overline{AC}$ reflexive

$\angle D \cong \angle B$ 3rd ∠ Thm.

$\Delta ACD \cong \Delta CAB$ def. of ≅ figures

Theorem 4.4: Properties of Congruent Triangles

- Reflexive: $\Delta ABC \cong \Delta ABC$
- Symmetric: If $\Delta ABC \cong \Delta XYZ$, then $\Delta XYZ \cong \Delta ABC$
- Transitive: If $\Delta ABC \cong \Delta XYZ$ and $\Delta XYZ \cong \Delta EFJ$, then $\Delta ABC \cong \Delta EFJ$

Homework: Chapter 4.2 pg.228
#'s 3,5-8,11,12,16,20,26