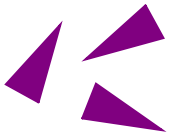
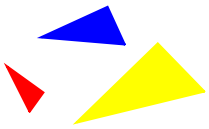
# Congruent Triangles
(part 1)

title

Congruent figures—two geometric figures that have exactly the same size and shape



congruent



not congruent

Corresponding parts—a pair of sides or angles that have the same relative position in two congruent figures

congruent figures

Congruence Statement

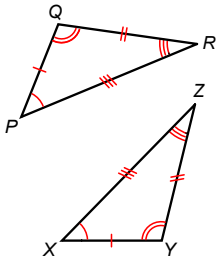
$\Delta PQR \cong \Delta XYZ$

Corresponding Angles

$\angle P \cong \angle X$
$\angle Q \cong \angle Y$
$\angle R \cong \angle Z$

Corresponding Sides

$\overline{PQ} \cong \overline{XY}$ $\overline{QR} \cong \overline{YZ}$
$\overline{PR} \cong \overline{XZ}$




examples

In the diagram, $\Delta TJM \cong \Delta PHS$. Complete the statement.

$\Delta HPS \cong$ $\Delta JTM$

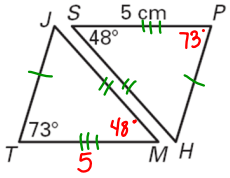
$\overline{JM} \cong$ $\overline{HS}$

$\angle S \cong$ $\angle M$

$m\angle P =$ $m\angle T$

$TM =$ $PS$

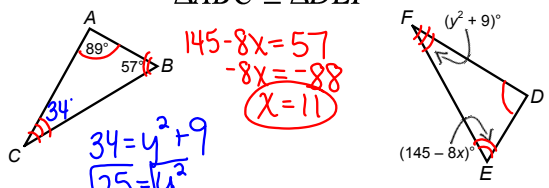
$m\angle J =$ $m\angle H$




examples

Use the given information to find the values of *x* and *y*.

$\Delta ABC \cong \Delta DEF$




$145 - 8x = 57$
$-8x = -88$
$x = 11$

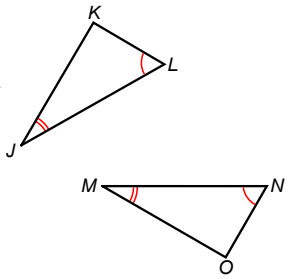
$34 = y^2 + 9$
$\sqrt{25} = \sqrt{y^2}$
$y = 5$ or $-5$
$\pm 5$

examples

## *Third Angles Theorem*

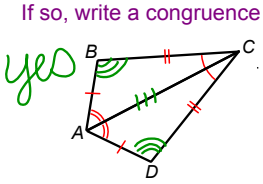
If two angles of one triangle are congruent to two angles of another triangle, then the third angles are also congruent.

2 ∡s of 1 Δ are ≅ to 2 ∡s of another Δ then the 3rd ∡s are ≅



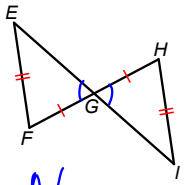

third angles theorem

Are the figures congruent?
If so, write a congruence statement.




yes

$\Delta ABC \cong \Delta ADC$




No not ≅

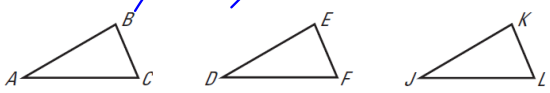
examples

## *Properties of Congruent Triangles*

**REFLEXIVE PROPERTY**
Every triangle is congruent to itself.

**SYMMETRIC PROPERTY**
If $\Delta ABC \cong \Delta DEF$, then $\Delta DEF \cong \Delta ABC$.

**TRANSITIVE PROPERTY**
If $\Delta ABC \cong \Delta DEF$ and $\Delta DEF \cong \Delta JKL$, then $\Delta ABC \cong \Delta JKL$.




properties

## Conclusion

1. Does the order matter when writing congruent triangles? yes!
2. How do you know if triangles are congruent given two triangles? All corresponding ∠s and sides are ≅
3. What is the third angle theorem?
4. Questions????

Oct 21-1:23 PM

## Assignment

## Congruent Triangle #1 Wkst

Oct 21-1:25 PM