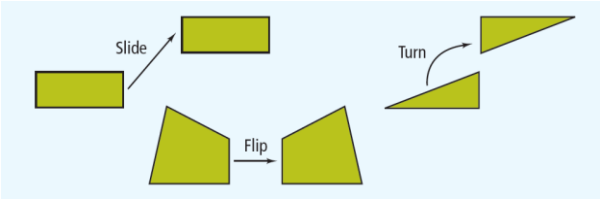
4-1 Congruent Figures Notes

Congruent figures have the same size and shape. When two figures are congruent, you can slide, flip, or turn one so that it fits exactly on the other one, as shown below. In this lesson, you will learn how to determine if geometric figures are congruent.



In two ***congruent figures***, all the parts of one figure are congruent to the ***corresponding parts*** of the other figure. In congruent polygons, this means that the corresponding sides and the corresponding angles are congruent.

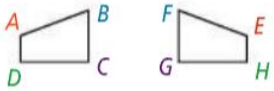
take note

Key Concept **Congruent Figures**

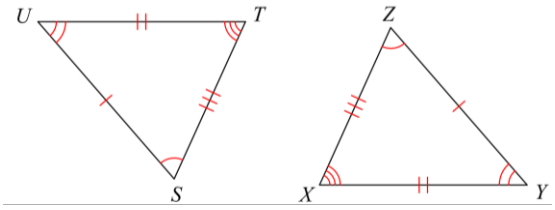
Definition

Congruent polygons have congruent corresponding parts—their matching sides and angles. When you name congruent polygons, you must list corresponding vertices in the same order.

Example



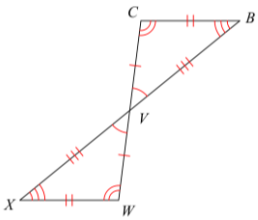
Practice with Congruence Statements



Corresponding Sides:

Corresponding Angles:

Congruence Statement:



Corresponding Sides:

Corresponding Angles:

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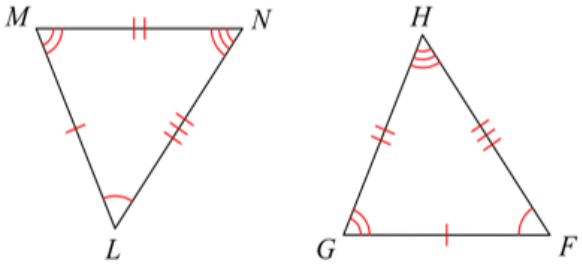
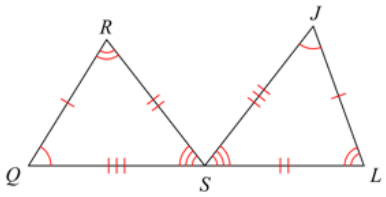


Corresponding Sides:

Corresponding Angles:

Congruence Statement:



Corresponding Sides:

Corresponding Angles:

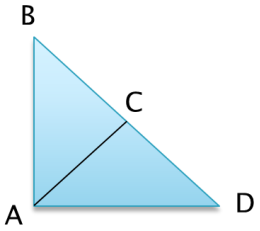
Congruence Statement:

Example: Finding Congruent Parts

If △BCA≅ △DCA, name the congruent corresponding parts?

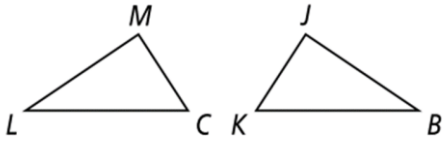
Sides:

Angles:



You Try!

△LMC ≅ △BJK. Complete the congruence statements.



1) **2)** **3)**

4) **5)** **6)**

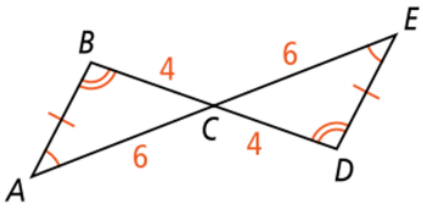
If ML = 10, KB = 9, m∠L = 44°, and m∠J = 50°, find the following values. (Draw your given info in the pic!)

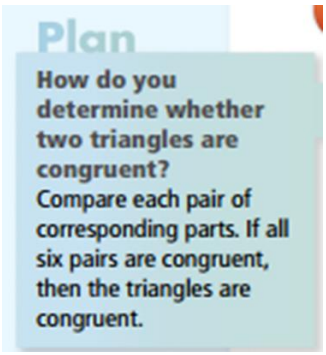
7) **8)** **9)** **10)**

Finding Congruent Triangles:

Are the triangles congruent? Justify your answer.

- $\overline{AB} \cong \overline{ED}$
- $\angle A \cong \angle E$, $\angle B \cong \angle D$ ***Given***





Example:

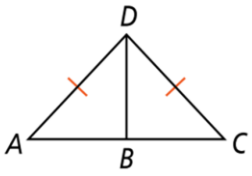
△ABD ≅ △CBD

If m∠A = 3x + 10° & m∠C = 4x°

Find each angle measure:

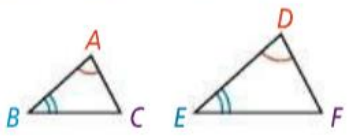
$m\angle A$ = _____

$m\angle C$ = _____



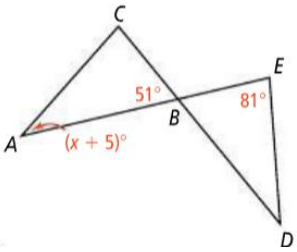
take note

Theorem 4-1 Third Angles Theorem

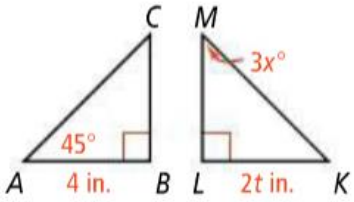
Theorem	If . . .	Then . . .
If two angles of one triangle are congruent to two angles of another triangle, then the third angles are congruent.	$\angle A \cong \angle D$ and $\angle B \cong \angle E$ 	

Algebra Practice – Find the value of the variables in the pictures below

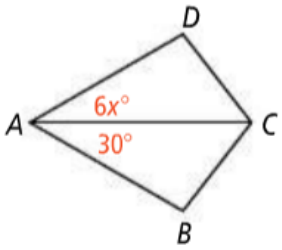
1. $\Delta ABC \cong \Delta DBE$



2. $\Delta ABC \cong \Delta KLM$

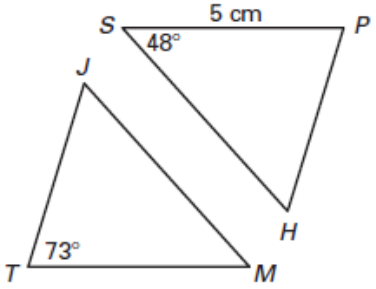


3. $\Delta ACD \cong \Delta ACB$

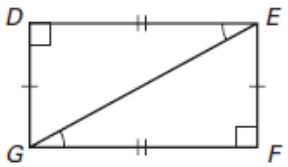


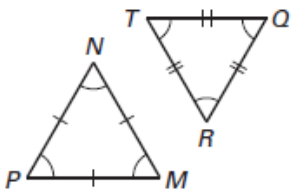
In the diagram, $\triangle TJM \cong \triangle PHS$. Complete the statement.

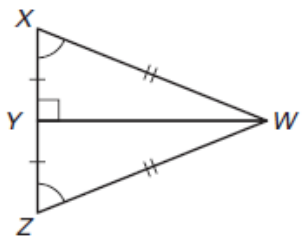
2. $\angle P \cong$ _____
3. $\overline{JM} \cong$ _____
4. $m\angle M =$ _____°
5. $m\angle P =$ _____°
6. $MT =$ _____
7. $\triangle HPS \cong$ _____



Identify any figures that can be proved congruent. Explain your reasoning. For those that can be proved congruent, write a congruence statement.

8. 

9. 

10. 

Complete this statement.

10. If $\triangle WRD \cong \triangle PLK$, then $\overline{WR} \cong$ _____.

11. If $\triangle BGT \cong \triangle DSN$, then $\angle T \cong$ _____.

12. If $\triangle SVP \cong \triangle MTQ$, then $\overline{PS} \cong$ _____.

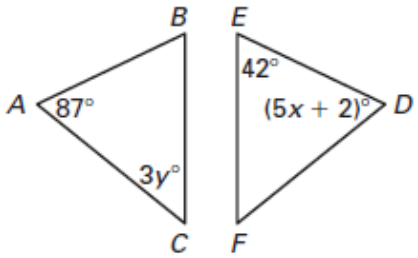
13. If $\triangle JCX \cong \triangle MWP$, then $\overline{XC} \cong$ _____.

14. If $\triangle RHK \cong \triangle WVO$, then $\triangle KRH \cong$ _____.

15. If $\triangle PMC \cong \triangle LDX$, then $\angle M \cong$ _____.

In Exercises 11 and 12, use the given information to find the indicated values.

11. Given $\triangle ABC \cong \triangle DEF$, find the values of x and y.



12. Given $\triangle HJK \cong \triangle TRS$, find the values of a and b.