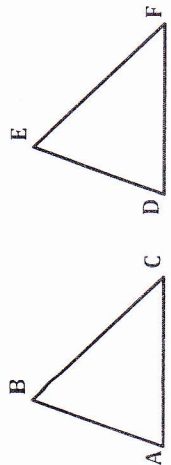# NOTES 5.2 & 5.4 – CONGRUENT TRIANGLES

Objective: _____

CONGRUENT TRIANGLES:

EXAMPLE 1: If $\triangle ABC \cong \triangle DEF$, then…

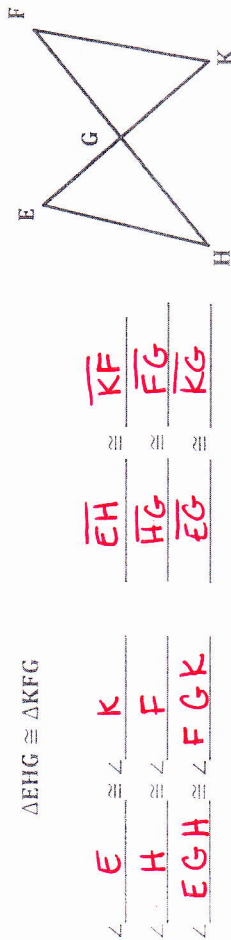$\angle A \cong \angle\ D$ $\overline{AB} \cong \overline{DE}$

$\angle B \cong \angle\ E$ $\overline{BC} \cong \overline{EF}$

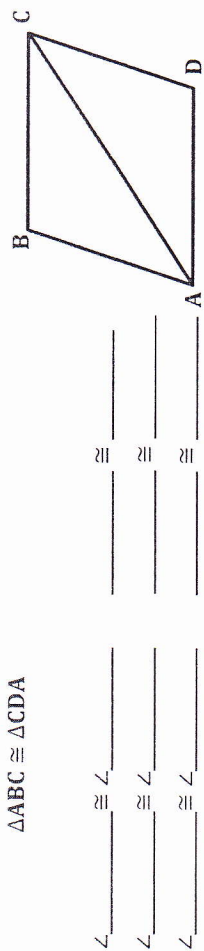$\angle C \cong \angle\ F$ $\overline{AC} \cong \overline{DF}$

EXAMPLE 2: If $\triangle XYZ \cong \triangle WMN$, determine whether the following statements are TRUE or FALSE.

| STATEMENT	TRUE	FALSE
$\triangle YZX \cong \triangle WMN$		
$\triangle ZXY \cong \triangle NWM$		
$\triangle YZX \cong \triangle NMW$		
$\triangle ZYX \cong \triangle NMW$		

EXAMPLE 3: Use the given figure and information to name three pairs of congruent angles and three pairs of congruent sides.

$\triangle EHG \cong \triangle KFG$

$\angle\ E \cong \angle\ K$ $\overline{EH} \cong \overline{KF}$

$\angle\ H \cong \angle\ F$ $\overline{HG} \cong \overline{FG}$

$\angle\ EGH \cong \angle\ FGK$ $\overline{EG} \cong \overline{KG}$

EXAMPLE 4: Use the given figure and information to name three pairs of congruent angles and three pairs of congruent sides.

$\triangle ABC \cong \triangle CDA$

$\angle \_\_\_ \cong \angle \_\_\_$ $\_\_\_ \cong \_\_\_$

$\angle \_\_\_ \cong \angle \_\_\_$ $\_\_\_ \cong \_\_\_$
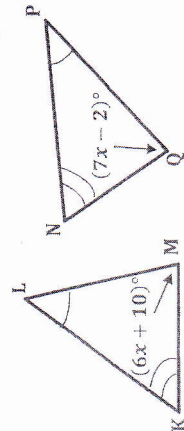
$\angle \_\_\_ \cong \angle \_\_\_$ $\_\_\_ \cong \_\_\_$

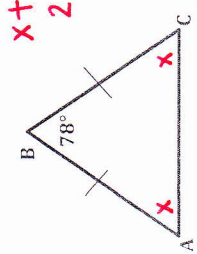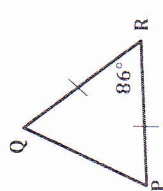EXAMPLE 5: Using the diagram, complete the congruence statement.
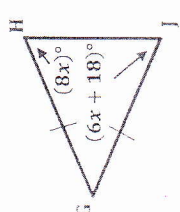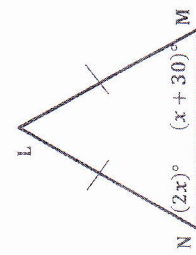

$\triangle ABC \cong \triangle \_\_\_$
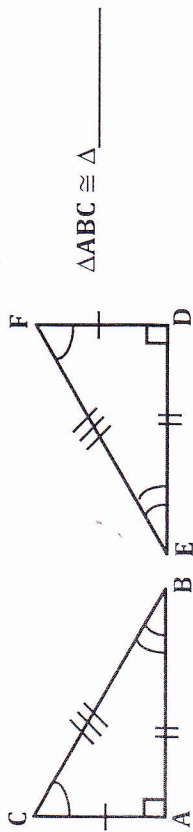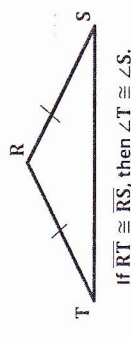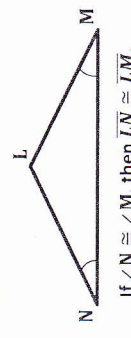
EXAMPLE 6: If $\triangle DOG \cong \triangle CAT$, DO = 10, OG = 12, DG = 16, and AT = $2x + 6$, find the value of 'x'.

If two angles of one triangle are congruent to two angles of another triangle, then the third pair of angles are congruent.
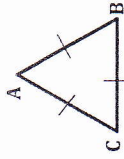
EXAMPLE 7: Find $m\angle M$ and $m\angle Q$.

$(6x + 10)^\circ$ $(7x - 2)^\circ$

10/18/16

ISOSCELES & EQUILATERAL TRIANGLES

THEOREM	DIAGRAM
ISOSCELES TRIANGLE THEOREM If two sides of a triangle are congruent, then the angles opposite the sides are congruent.	If $\overline{RT} \cong \overline{RS}$, then $\angle T \cong \angle S$.
CONVERSE OF ISOSCELES TRIANGLE THEOREM If two angles of a triangle are congruent, then the sides opposite those angles are congruent.	If $\angle N \cong \angle M$, then $\overline{LN} \cong \overline{LM}$.

EXAMPLES:

1. $m\angle C =$ __$51°$__

$$x + x + 78 = 180$$
$$2x + 78 = 180$$
$$2x = 102$$
$$x = 51$$

2. $m\angle Q =$ _____

3. $m\angle H =$ _____

4. $m\angle M =$ _____

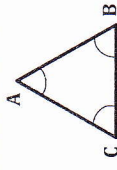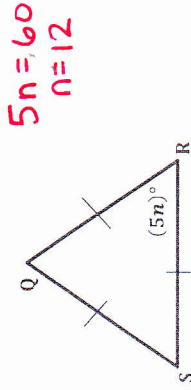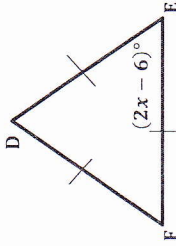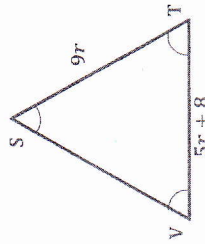| COROLLARY	DIAGRAM
EQUILATERAL TRIANGLE COROLLARY If a triangle is equilateral, then it is equiangular.	If $\overline{AB} \cong \overline{BC} \cong \overline{AC}$, then $\angle A \cong \angle B \cong \angle C$.
EQUIANGULAR TRIANGLE COROLLARY If a triangle is equiangular, then it is equilateral.	If $\angle A \cong \angle B \cong \angle C$, then $\overline{AB} \cong \overline{BC} \cong \overline{AC}$.

EXAMPLES:

5. $n =$ __12__

$$5n = 60$$
$$n = 12$$

$(5n)°$

6. $x =$ _____

$(2x - 6)°$

7. $VT =$ _____

$9r$, $5r + 8$

8. $MN =$ _____

$y + 10$, $4y + 1$

10/18/16