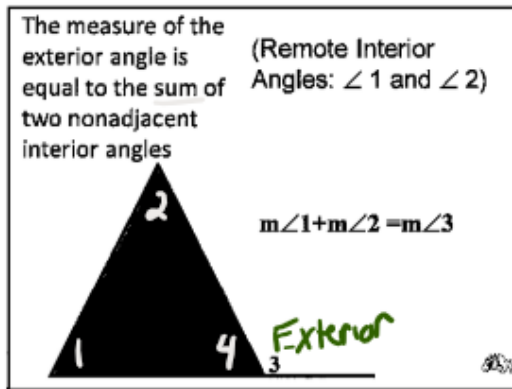
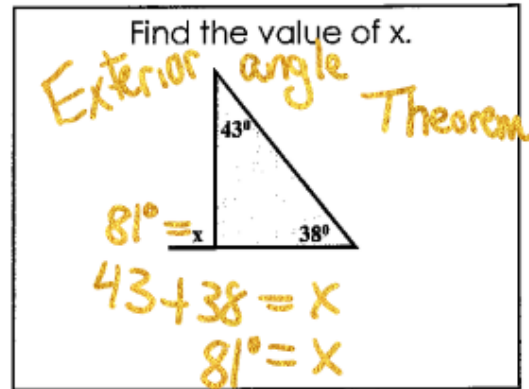


Today we continued studying angle properties with a focus on the triangle exterior angle theorem. After notes we completed a review activity that can be found at <http://bit.ly/anglesbreakout>

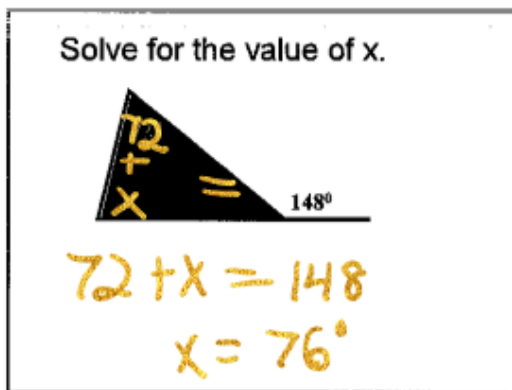
Tonight's homework is to complete this activity if not finished in class and to complete pages 18 and 19 in the packet.



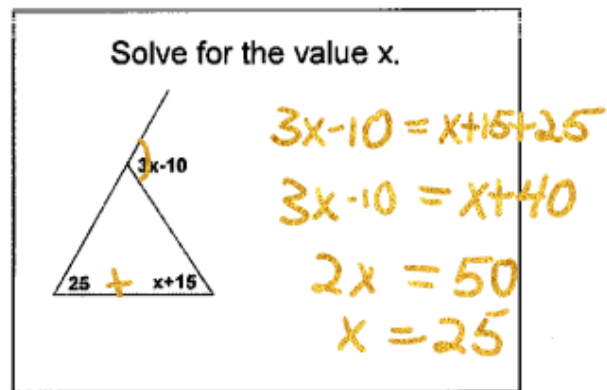
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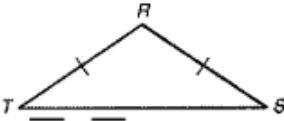
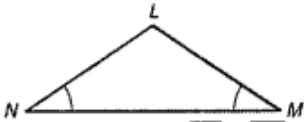
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10

## Notes

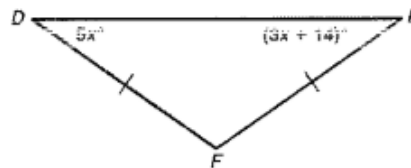
### Isosceles and Equilateral Triangles

Theorem	Examples
<b>Isosceles Triangle Theorem</b> If two sides of a triangle are congruent, then the angles opposite the sides are congruent.	 If $\overline{RT} \cong \overline{RS}$ , then $\angle T \cong \angle S$ .
<b>Converse of Isosceles Triangle Theorem</b> If two angles of a triangle are congruent, then the sides opposite those angles are congruent.	 If $\angle N \cong \angle M$ , then $\overline{LN} \cong \overline{LM}$ .

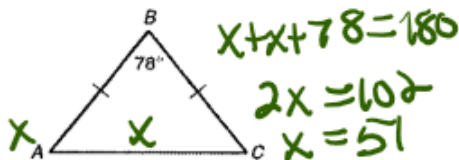
You can use these theorems to find angle measures in isosceles triangles.

Find  $m\angle E$  in  $\triangle DEF$ .

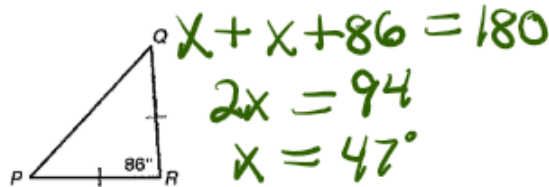
$m\angle D = m\angle E$       Isosc.  $\triangle$  Thm.  
 $5x8 = (3x + 14)8$       Substitute the given values.  
 $2x = 14$       Subtract  $3x$  from both sides.  
 $x = 7$       Divide both sides by 2.  
 Thus  $m\angle E = 3(7) + 14 = 358$ .



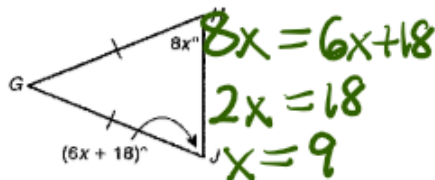
Find each angle measure.



1.  $m\angle C = 51^\circ$

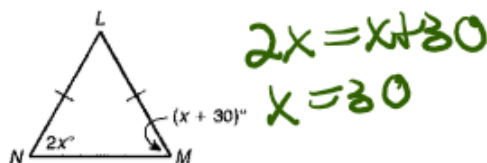


2.  $m\angle Q = 47^\circ$



3.  $m\angle H = 72^\circ$

$$8(9) = 72$$



4.  $m\angle M = 60^\circ$

$$30 + 30 = 60$$

## Notes

### Isosceles and Equilateral Triangles *continued*

#### Equilateral Triangle Corollary

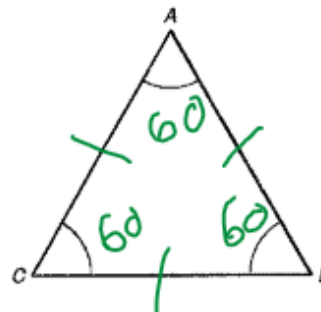
If a triangle is equilateral, then it is equiangular.

(equilateral  $\triangle \rightarrow$  equiangular  $\triangle$ )

#### Equiangular Triangle Corollary

If a triangle is equiangular, then it is equilateral.

(equiangular  $\triangle \rightarrow$  equilateral  $\triangle$ )



$$180^\circ = 3x$$

$$x = 60$$

If  $\angle A > \angle B > \angle C$ , then  $\overline{AB} \cong \overline{BC} \cong \overline{CA}$ .

You can use these theorems to find values in equilateral triangles.

#### Find $x$ in $\triangle STV$ .

$\triangle STV$  is equiangular.

$$(7x + 4)^\circ = 60^\circ$$

$$7x = 56$$

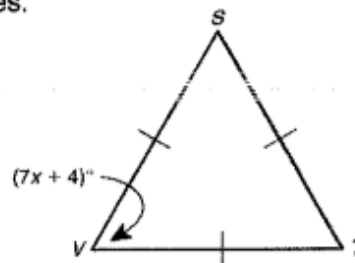
$$x = 8$$

Equilateral  $\triangle \rightarrow$  equiangular  $\triangle$

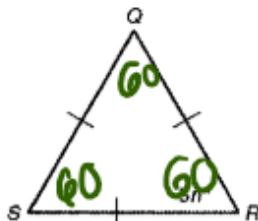
The measure of each  $\angle$  of an equiangular  $\triangle$  is  $60^\circ$ .

Subtract 4 from both sides.

Divide both sides by 7.



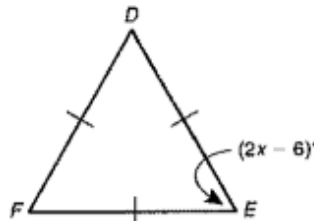
Find each value.



5.  $n =$  12

$$5n = 60$$

$$n = 12$$

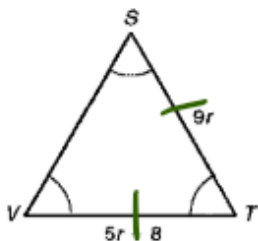


6.  $x =$  33

$$2x - 6 = 60$$

$$2x = 66$$

$$x = 33$$



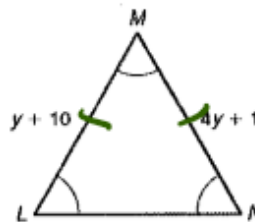
7.  $VT =$  18

$$VT = 5(2) + 8 = 18$$

$$9r = 5r + 8$$

$$4r = 8$$

$$r = 2$$



8.  $MN =$  13

$$MN = 4(3) + 1 = 13$$

$$y + 10 = 4y + 1$$

$$9 = 3y$$

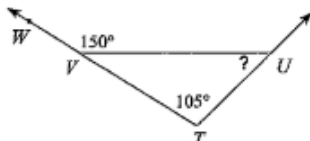
$$3 = y$$

# Assignment

Date \_\_\_\_\_ Period \_\_\_\_\_

Find the measure of each angle indicated.

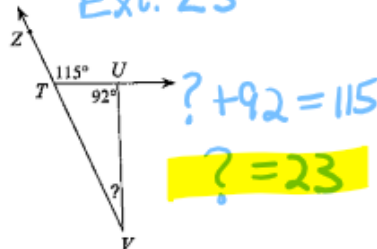
1) Ext.  $\angle$ 's



$$105 + ? = 150$$

$$? = 45^\circ$$

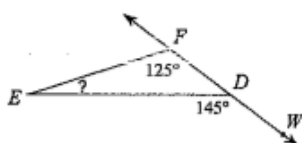
2) Ext.  $\angle$ 's



$$? + 92 = 115$$

$$? = 23$$

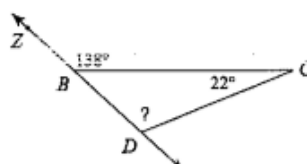
3)



$$x + 125 = 145$$

$$x = 20$$

4)

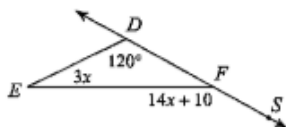


$$x + 22 = 138$$

$$x = 116^\circ$$

Solve for x.

5)

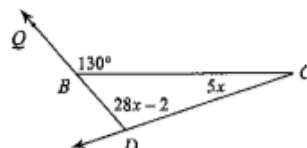


$$3x + 120 = 14x + 10$$

$$110 = 11x$$

$$10 = x$$

6)



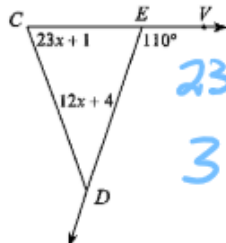
$$5x + 28x - 2 = 130$$

$$33x - 2 = 130$$

$$33x = 132$$

$$x = 4$$

7)



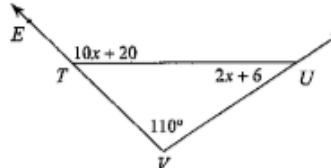
$$23x + 1 + 12x + 4 = 110$$

$$35x + 5 = 110$$

$$35x = 105$$

$$x = 3$$

8)



$$2x + 6 + 110 = 10x + 20$$

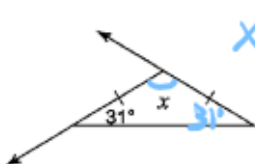
$$2x + 116 = 10x + 20$$

$$96 = 8x$$

$$12 = x$$

Find the value of  $x$ .

9)



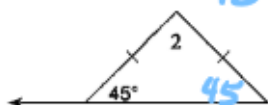
$$\begin{aligned}x + 31 + 31 &= 180 \\x + 62 &= 180 \\x &= 118^\circ\end{aligned}$$

10)



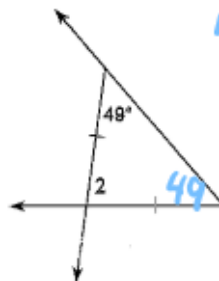
$$\begin{aligned}x + x + 44 &= 180 \\2x + 44 &= 180 \\2x &= 136 \\x &= 68\end{aligned}$$

11)  $m\angle 2 = x + 96$



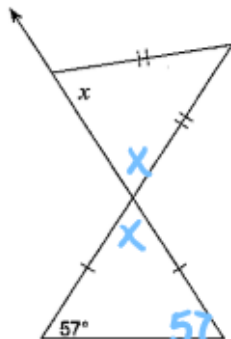
$$\begin{aligned}45 + 45 + x + 96 &= 180 \\186 + x &= 180 \\x &= -6\end{aligned}$$

12)  $m\angle 2 = 12x + 10$



$$\begin{aligned}49 + 49 + 12x + 10 &= 180 \\12x + 108 &= 180 \\12x &= 72 \\x &= 6\end{aligned}$$

13)



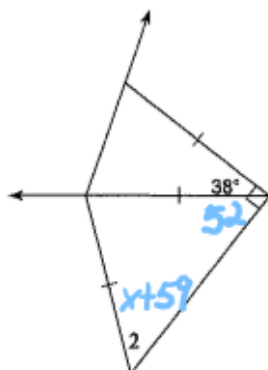
$$\begin{aligned}57 + 57 + x &= 180 \\x + 114 &= 180 \\x &= 66\end{aligned}$$

14)



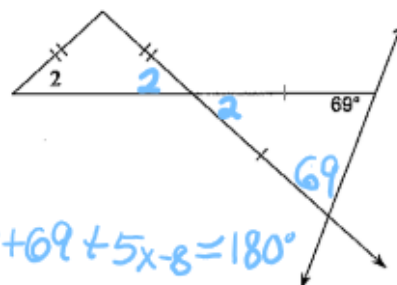
$$\begin{aligned}x + x + 68 &= 180 \\2x + 68 &= 180 \\2x &= 112 \\x &= 56\end{aligned}$$

15)  $m\angle 2 = x + 59$



$$\begin{aligned}x + 59 &= 52 \\x &= -7\end{aligned}$$

16)  $m\angle 2 = 5x - 8$



$$\begin{aligned}69 + 69 + 5x - 8 &= 180 \\5x + 130 &= 180 \\5x &= 50 \\x &= 10\end{aligned}$$