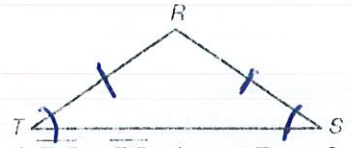
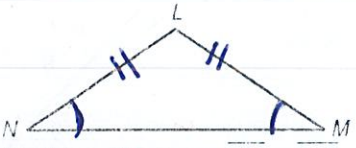
Name _____ Date _____ Class _____

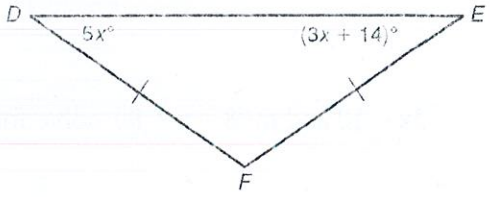
Notes * RAMP UP LEVEL OF DIFFICULTY *

Isosceles and Equilateral Triangles

Theorem	Examples
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 $\overline{LN} \cong \overline{LM}$.

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

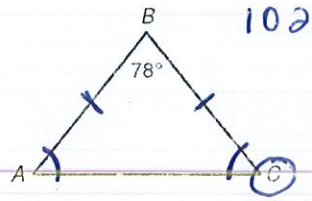
Find $m\angle E$ in $\triangle DEF$.



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

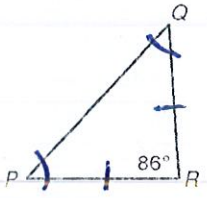
Thus $m\angle E = 3(7) + 14 = 358$.

Find each angle measure.



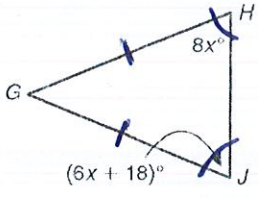
102° Left

1. $m\angle C =$ 51°



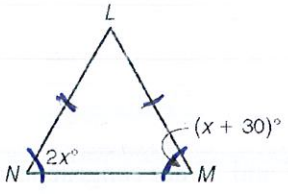
94° Left

2. $m\angle Q =$ 47°



8(9)

3. $m\angle H =$ 72°



4. $m\angle M =$ 60°

$6x + 18 = 8x$
$18 = 2x$
$9 = x$

$2x = x + 30$
$x = 30°$

Name _____ Date _____ Class _____

Notes

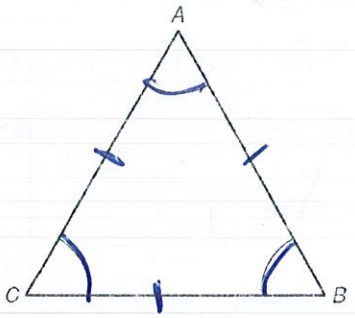
Isosceles and Equilateral Triangles continued

Equilateral Triangle Corollary
If a triangle is equilateral, then it is equiangular.

(equilateral △ → equiangular △)

Equiangular Triangle Corollary 60°
If a triangle is equiangular, then it is equilateral.

(equiangular △ → equilateral △)

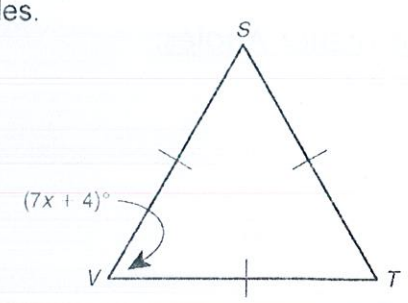


If $\angle A > \angle B > \angle C$, then $\overline{AB} \cong \overline{BC} \cong \overline{CA}$.

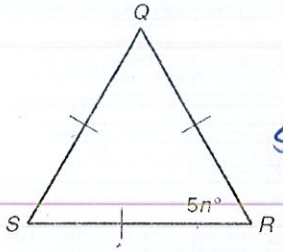
You can use these theorems to find values in equilateral triangles.

Find *x* in △*STV*.

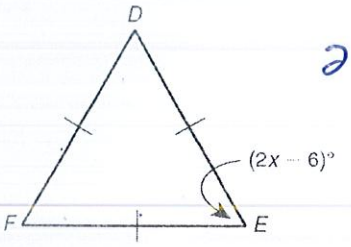
△*STV* is equiangular.	Equilateral △ → equiangular △
$(7x + 4)8 = 60°$	The measure of each ∠ of an equiangular △ is 60°.
$7x = 56$	Subtract 4 from both sides.
$x = 8$	Divide both sides by 7.



Find each value.



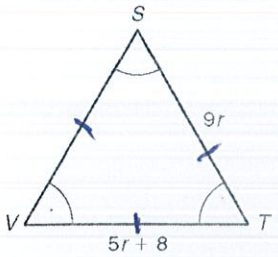
5n = 60



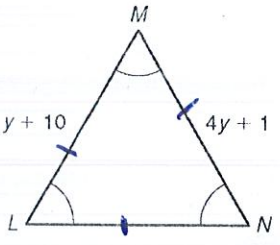
2x − 6 = 60
2x = 66
x =

5. $n =$ 12

6. $x =$ 33



9r = 5r + 8
4r = 8
r = 2



y + 10 = 4y + 1
9 = 3y
3 = y

7. $VT =$ 18

5(2) + 8

8. $MN =$ 13

4(3) + 1

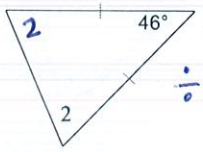
Geometry Name _____

1.3 - Practice

Date _____

Find the value of *x*.

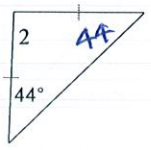
1) $m\angle 2 = 5x + 7$



180
− 46
134
÷ 2
67

67 = 5x + 7
60 = 5x
12 = x

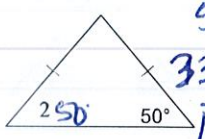
2) $m\angle 2 = 15x + 2$



180
− 88
92

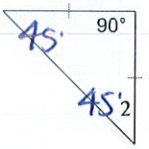
92 = 15x + 2
90 = 15x
6 = x

3) $m\angle 2 = 3x + 17$



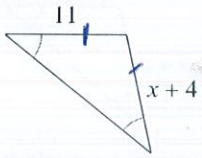
50 = 3x + 17
33 = 3x
11 = x

4) $m\angle 2 = 4x + 5$



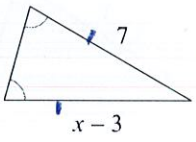
45 = 4x + 5
40 = 4x
10 = x

5)



11 = x + 4
7 = x

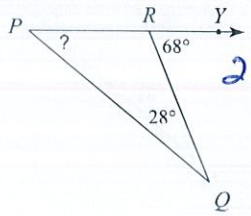
6)



7 = x − 3
10 = x

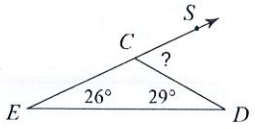
Find the measure of each angle indicated.

7)



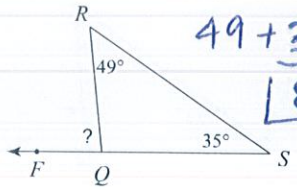
28 + x = 68
x = 40

8)



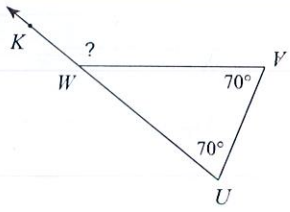
26 + 29 = x
55 = x

9)



49 + 35 = x
84 = x

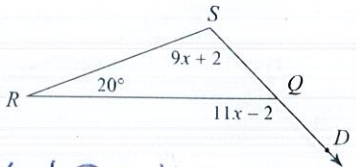
10)



x = 70 + 70
x = 140

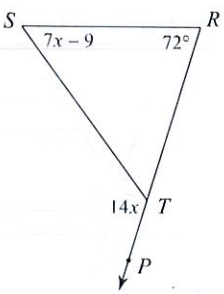
Solve for *x*.

11)



20 + 9x + 2 = 11x − 2
22 + 9x = 11x − 2
24 = 2x
12 = x

12)



7x − 9 + 72 = 14x
7x + 63 = 14x
63 = 7x
9 = x

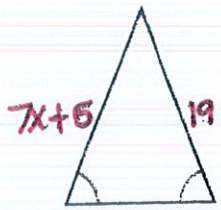
Name: _____ Date: _____

Angles in Triangles Homework

Base Angles Theorem:

Find the value of x.

1)

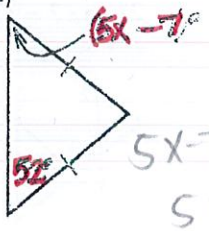


$7x+5=19$

$7x=14$

$x=2$

2)



$5x-7=52$

$5x=59$

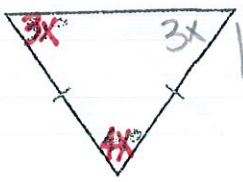
$x=11.8$

3)

$3x+4x+3x=180$

$10x=180$

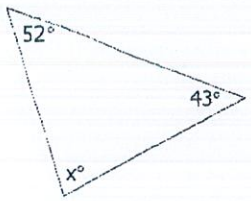
$x=18$



Sum of Interior Angles:

Solve for x.

4)

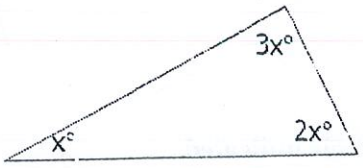


$52+43+y=180$

$95+x=180$

$x=85$

5)

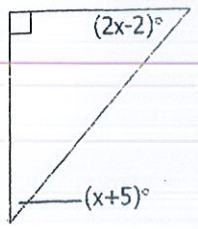


$3x+2x+x=180$

$6x=180$

$x=30$

6)



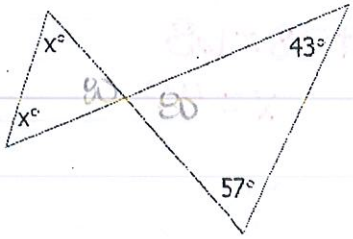
$90+2x-2+x+5$

$93+3x=180$

$3x=87$

$x=29$

7)



$180-43-57=80$

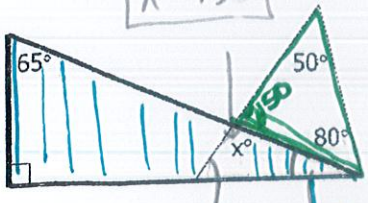
$180-80=100$

$x=50$

8)

$x=180-80$

$x=130$



$180-90-65=25$

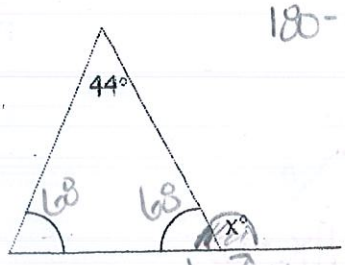
25

$180-90-80=25$

25

9)

$180-44=136 \div 2=68$



linear pair = 112°