

LESSON 4.1

**Practice**

For use with pages 216-224

Complete the sentence with *always*, *sometimes*, or *never*.

1. An isosceles triangle is ? a right triangle.

*Sometimes*



2. An obtuse triangle is ? a right triangle.

*Never*

3. A right triangle is ? an equilateral triangle.

*Never*

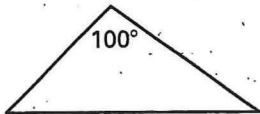
4. A right triangle is ? an isosceles triangle.

*Sometimes*



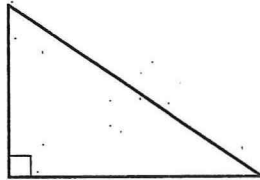
Classify the triangle by its sides and by its angles.

5.



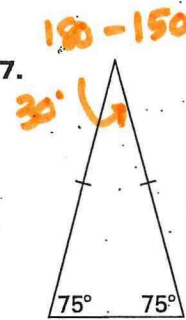
*Scalene  
Obtuse*

6.



*Scalene  
Right*

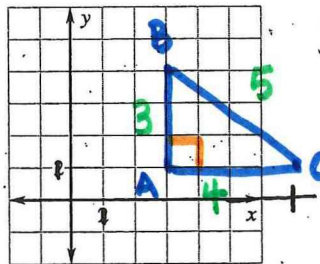
7.



*Isosceles  
Acute*

A triangle has the given vertices. Graph the triangle and classify it by its sides. Then determine if it is a right triangle.

8.  $A(3, 1), B(3, 4), C(7, 1)$



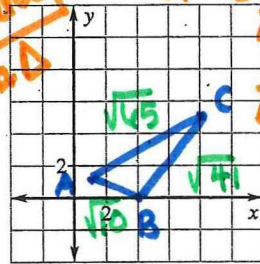
$AB = 3$   
 $AC = 4$

$BC = \sqrt{(7-3)^2 + (1-4)^2}$   
 $= \sqrt{(4)^2 + (-3)^2}$   
 $= \sqrt{16 + 9}$   
 $= \sqrt{25}$   
 $BC = 5$

$\overline{AC}: m = 0$   
 $\overline{AB}: m = \text{undefined}$   
 $\overline{BC}: m = -\frac{3}{4}$

**Scalene  $\Delta$ , Right  $\Delta$**

9.  $A(1, 1), B(4, 0), C(8, 5)$

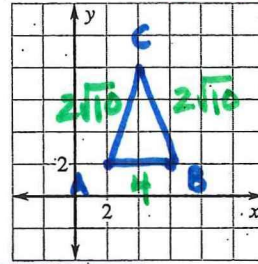


**Scalene  $\Delta$   
Not a  $\Delta$**

$AB = \sqrt{(4-1)^2 + (0-1)^2}$   
 $= \sqrt{(3)^2 + (-1)^2}$   
 $= \sqrt{9+1}$   
 $AB = \sqrt{10}$

$AC = \sqrt{(8-1)^2 + (5-1)^2}$   
 $= \sqrt{(7)^2 + (4)^2}$   
 $= \sqrt{49+16}$   
 $AC = \sqrt{65}$

10.  $A(2, 2), B(6, 2), C(4, 8)$



$AB = 4$   
 $AC = \sqrt{(4-2)^2 + (8-2)^2}$   
 $= \sqrt{(2)^2 + (6)^2}$   
 $= \sqrt{4+36}$   
 $AC = \sqrt{40} = 2\sqrt{10}$

$BC = \sqrt{(4-6)^2 + (8-2)^2}$   
 $= \sqrt{(-2)^2 + (6)^2}$   
 $= \sqrt{4+36}$   
 $BC = \sqrt{40} = 2\sqrt{10}$

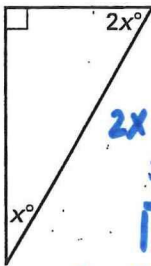
**Isosceles  
Not a  $\Delta$**

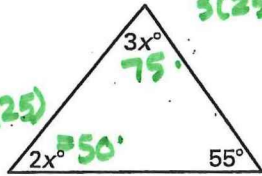
$\overline{AB}: m = 0$   
 $\overline{AC}: m = 3$   
 $\overline{BC}: m = -3$

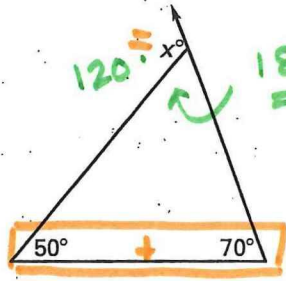
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**LESSON 4.1 Practice** *continued*  
For use with pages 216–224

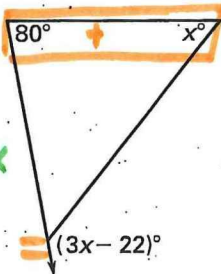
Find the value of  $x$ . Then classify the triangle by its angles.

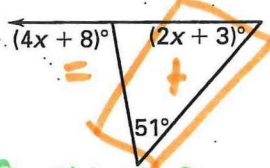
11.   $2x + x = 90$   
 $3x = 90$   
 $x = 30$   
Corollary  $\Delta$  Sum  
Right  $\Delta$

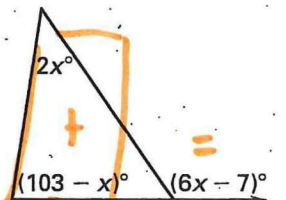
12.   $3(25) = 75$   
 $2(25) = 50$   
 $2x + 3x + 55 = 180$   
 $5x + 55 = 180$   
 $5x = 125$   
 $x = 25$   
 $\Delta$  sum  
Acute  $\Delta$

13.   $120 = x$   
 $180 - 120 = 60$   
 $x = 50 + 70$   
 $x = 120$   
Ext.  $\angle$  Sum.  
Acute  $\Delta$

Find the measure of the exterior angle shown.

14.   $3x - 22 = 80 + x$   
 $2x - 22 = 80$   
 $2x = 102$   
 $x = 51$

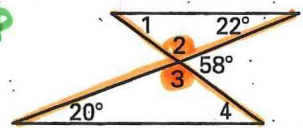
15.   $4x + 8 = 51 + 2x + 3$   
 $4x + 8 = 54 + 2x$   
 $2x + 8 = 54$   
 $2x = 46$   
 $x = 23$

16.   $6x - 7 = 2x + 103 - x$   
 $6x - 7 = x + 103$   
 $5x - 7 = 103$   
 $5x = 110$   
 $x = 22$

Find the measure of the numbered angle.

17.  $\angle 1$   $m\angle 1 + 22 = 58$   
 $m\angle 1 = 36$  Ext  $\angle$  Thm

18.  $\angle 2$   $m\angle 2 + 58 = 180$  LP  
 $m\angle 2 = 122$



19.  $\angle 3$   $m\angle 3 = 122$  VA

20.  $\angle 4$   $m\angle 4 + 20 = 58$   
 $m\angle 4 = 38$  Ext  $\angle$  Thm

21. In  $\Delta ABC$ ,  $m\angle A = m\angle B + 30^\circ$  and  $m\angle C = m\angle B + 60^\circ$ . Find the measure of each angle.

$m\angle A + m\angle B + m\angle C = 180$   $\Delta$  Sum  
 $(m\angle B + 30) + m\angle B + (m\angle B + 60) = 180$   
 $3(m\angle B) + 90 = 180$

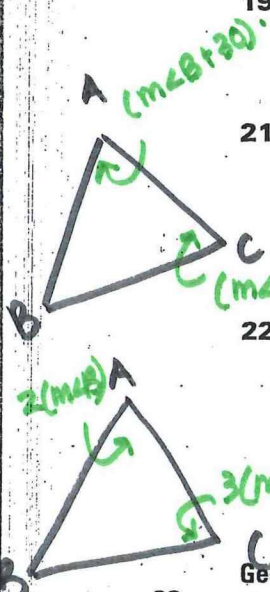
$3(m\angle B) = 90$   
 $m\angle B = 30$

$m\angle A = 30 + 30$   
 $m\angle A = 60$

$m\angle C = 30 + 60$   
 $m\angle C = 90$

22. In  $\Delta ABC$ ,  $m\angle A = 2(m\angle B)$  and  $m\angle C = 3(m\angle B)$ . Find the measure of each angle.

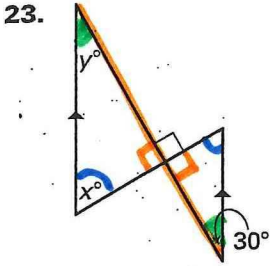
$m\angle A + m\angle B + m\angle C = 180$   $\Delta$  Sum  
 $2(m\angle B) + m\angle B + 3(m\angle B) = 180$   
 $6(m\angle B) = 180$   
 $m\angle B = 30$   
 $m\angle A = 2(30)$   
 $m\angle A = 60$   
 $m\angle B = 3(30)$   
 $m\angle B = 90$



**LESSON**  
**4.1**

**Practice** *continued*  
For use with pages 216–224

Find the values of  $x$  and  $y$ .

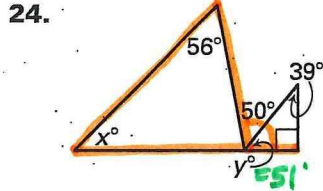
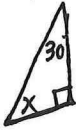


$y = 30^\circ$  A.I.

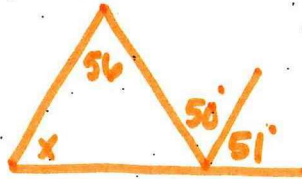
$x + 30 = 90$

$x = 60^\circ$

Corollary  $\Delta$  sum



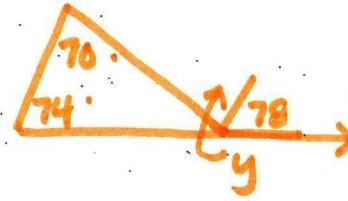
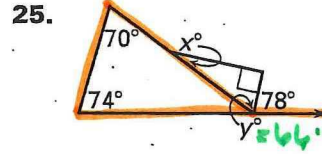
$y + 39 = 90$   
 $y = 51^\circ$  Corollary  $\Delta$  sum



$x + 56 = 50 + 51$

$x + 56 = 101$

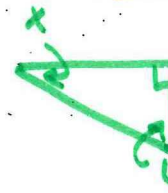
$x = 45^\circ$  Ext.  $\angle$  Thm



$70 + 74 = y + 78$

$144 = y + 78$

$y = 66^\circ$  Ext.  $\angle$  Thm.



$x + 66 = 90$   
 $x = 24^\circ$   
Corollary  $\Delta$  sum

26. **Metal Brace** The diagram shows the dimensions of a metal brace used for strengthening a vertical and horizontal wooden junction. Classify the triangle formed by its sides. Then copy the triangle, measure the angles, and classify the triangle by its angles.

