Homework

Pages 288 & 289: 1-6, 8-16 even

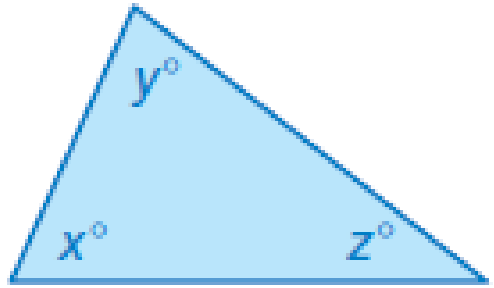
Extension 7.3 Angle Measures of Triangles

Key Ideas

Sum of the Angle Measures of a Triangle

Words The sum of the angle measures of a triangle is 180°.

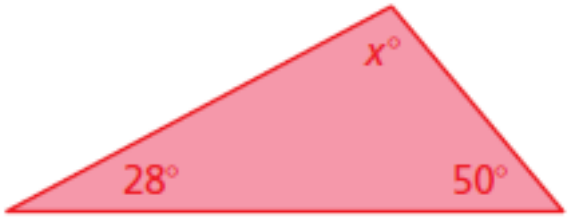
Algebra $x + y + z = 180$



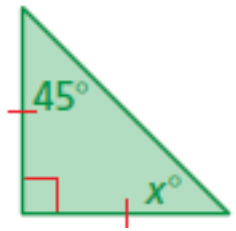
EXAMPLE 1 Finding Angle Measures

Find each value of x. Then classify each triangle.

a.



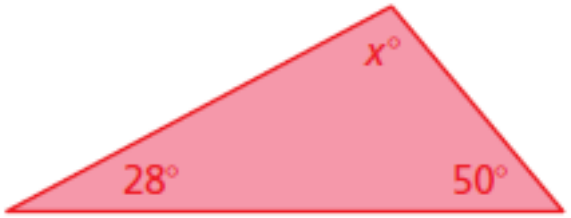
b.



EXAMPLE 1 Finding Angle Measures

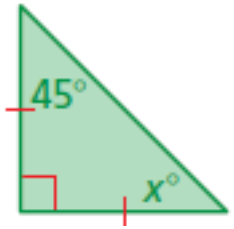
Find each value of x. Then classify each triangle.

a.



$x + 28 + 50 = 180$

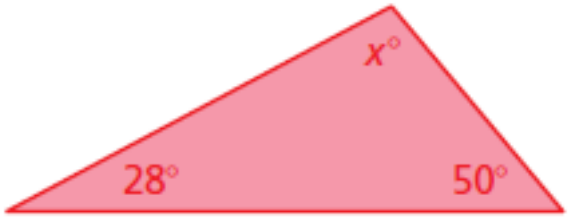
b.



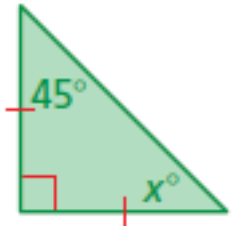
EXAMPLE 1 Finding Angle Measures

Find each value of x. Then classify each triangle.

a.



b.



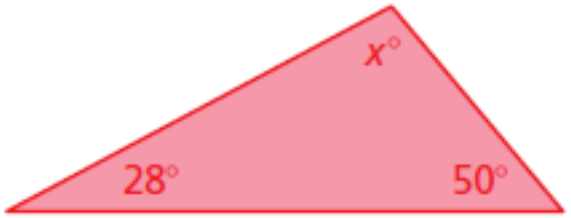
$$x + 28 + 50 = 180$$

$$x + 78 = 180$$

EXAMPLE 1 Finding Angle Measures

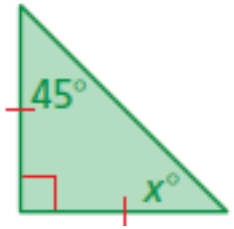
Find each value of x. Then classify each triangle.

a.



$$x + 28 + 50 = 180$$
$$x + 78 = 180$$
$$x = 102$$

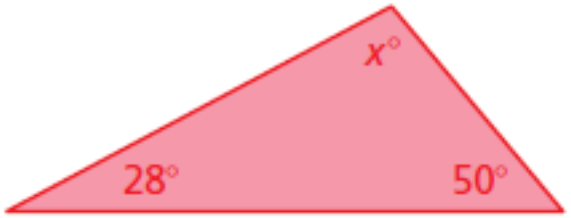
b.



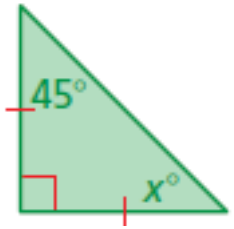
EXAMPLE 1 Finding Angle Measures

Find each value of x. Then classify each triangle.

a.



b.



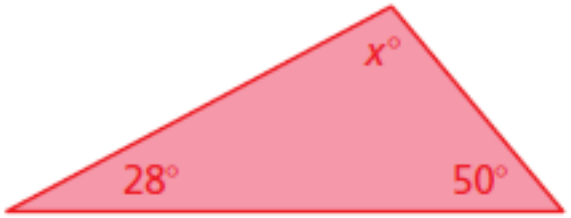
$$x + 28 + 50 = 180$$
$$x + 78 = 180$$
$$x = 102$$

∴ The value of x is 102. The triangle has one obtuse angle and no congruent sides. So, it is an obtuse scalene triangle.

EXAMPLE 1 Finding Angle Measures

Find each value of x. Then classify each triangle.

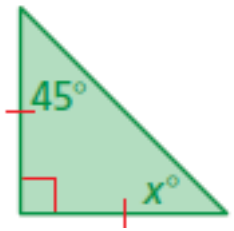
a.



$$x + 28 + 50 = 180$$
$$x + 78 = 180$$
$$x = 102$$

∴ The value of x is 102. The triangle has one obtuse angle and no congruent sides. So, it is an obtuse scalene triangle.

b.

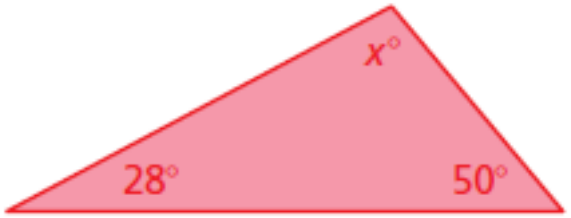


$$x + 45 + 90 = 180$$

EXAMPLE 1 Finding Angle Measures

Find each value of x. Then classify each triangle.

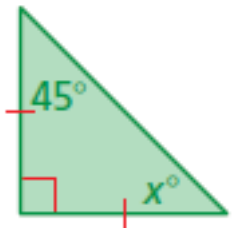
a.



$$x + 28 + 50 = 180$$
$$x + 78 = 180$$
$$x = 102$$

∴ The value of x is 102. The triangle has one obtuse angle and no congruent sides. So, it is an obtuse scalene triangle.

b.

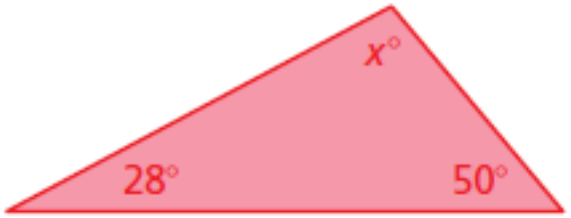


$$x + 45 + 90 = 180$$
$$x + 135 = 180$$

EXAMPLE 1 Finding Angle Measures

Find each value of x. Then classify each triangle.

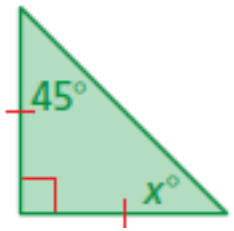
a.



$$x + 28 + 50 = 180$$
$$x + 78 = 180$$
$$x = 102$$

∴ The value of x is 102. The triangle has one obtuse angle and no congruent sides. So, it is an obtuse scalene triangle.

b.

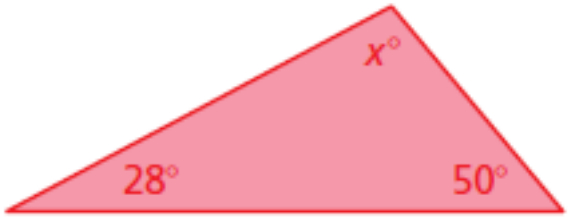


$$x + 45 + 90 = 180$$
$$x + 135 = 180$$
$$x = 45$$

EXAMPLE 1 Finding Angle Measures

Find each value of x. Then classify each triangle.

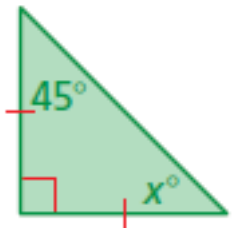
a.



$$x + 28 + 50 = 180$$
$$x + 78 = 180$$
$$x = 102$$

∴ The value of x is 102. The triangle has one obtuse angle and no congruent sides. So, it is an obtuse scalene triangle.

b.



$$x + 45 + 90 = 180$$
$$x + 135 = 180$$
$$x = 45$$

∴ The value of x is 45. The triangle has a right angle and two congruent sides. So, it is a right isosceles triangle.

Tell whether a triangle can have the given angle measures. If not, change the first angle measure so that the angle measures form a triangle.

$$x + y + z = 180$$

c. $25°, 64°, 91°$

$$25 + 64 + 91 = 180$$
$$89 + 91 = 180$$
$$180 = 180$$

d. $55.5°, 94°, 31.5°$

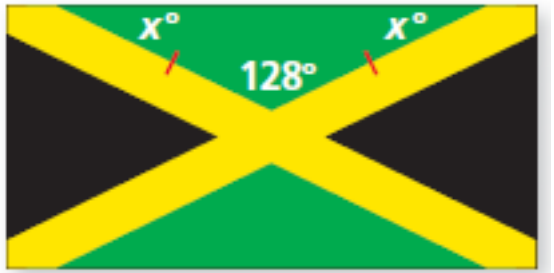
$$55.5 + 94 + 31.5 = 180$$
$$149.5 + 31.5 = 180$$
$$181 = 180$$

$$54.5 + 94 + 31.5 = 180$$
$$148.5 + 31.5 = 180$$
$$180 = 180$$

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica

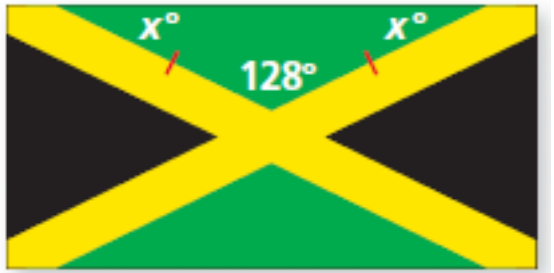


b. Flag of Cuba

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica



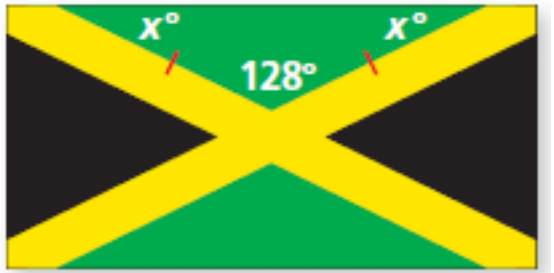
b. Flag of Cuba

$x + x + 128 = 180$

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica



b. Flag of Cuba

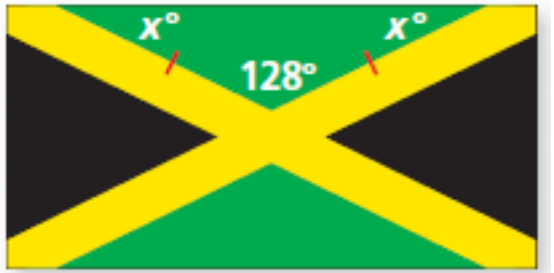
$$x + x + 128 = 180$$

$$2x + 128 = 180$$

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica



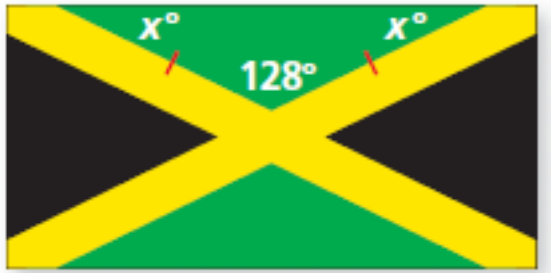
b. Flag of Cuba

$$x + x + 128 = 180$$
$$2x + 128 = 180$$
$$2x = 52$$

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica



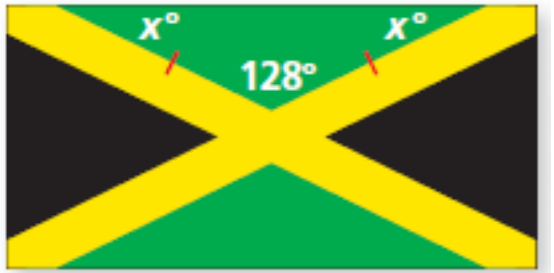
b. Flag of Cuba

$$x + x + 128 = 180$$
$$2x + 128 = 180$$
$$2x = 52$$
$$x = 26$$

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica



b. Flag of Cuba

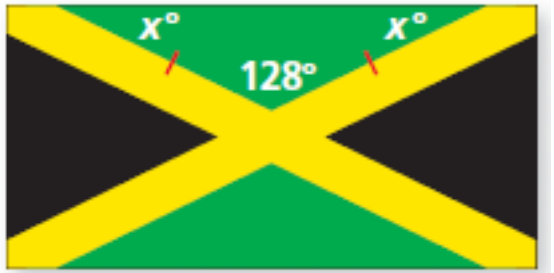
$$x + x + 128 = 180$$
$$2x + 128 = 180$$
$$2x = 52$$
$$x = 26$$

∴ The value of x is 26. The triangle has one obtuse angle and two congruent sides. So, it is an obtuse isosceles triangle.

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica



$$x + x + 128 = 180$$
$$2x + 128 = 180$$
$$2x = 52$$
$$x = 26$$

∴ The value of x is 26. The triangle has one obtuse angle and two congruent sides. So, it is an obtuse isosceles triangle.

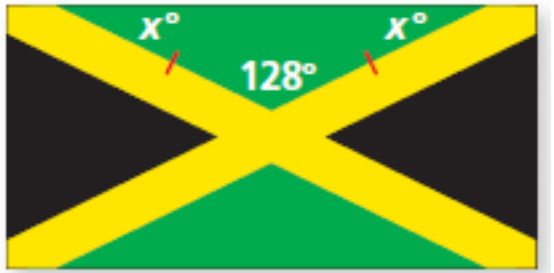
b. Flag of Cuba

$$x + x + 60 = 180$$

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica



$$x + x + 128 = 180$$
$$2x + 128 = 180$$
$$2x = 52$$
$$x = 26$$

∴ The value of x is 26. The triangle has one obtuse angle and two congruent sides. So, it is an obtuse isosceles triangle.

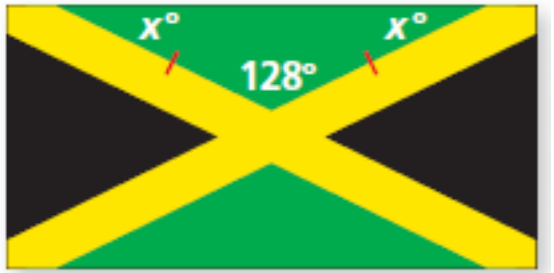
b. Flag of Cuba

$$x + x + 60 = 180$$
$$2x + 60 = 180$$

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica



$$x + x + 128 = 180$$
$$2x + 128 = 180$$
$$2x = 52$$
$$x = 26$$

∴ The value of x is 26. The triangle has one obtuse angle and two congruent sides. So, it is an obtuse isosceles triangle.

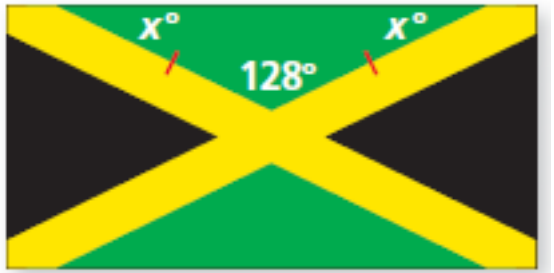
b. Flag of Cuba

$$x + x + 60 = 180$$
$$2x + 60 = 180$$
$$2x = 120$$

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica



$$x + x + 128 = 180$$
$$2x + 128 = 180$$
$$2x = 52$$
$$x = 26$$

∴ The value of x is 26. The triangle has one obtuse angle and two congruent sides. So, it is an obtuse isosceles triangle.

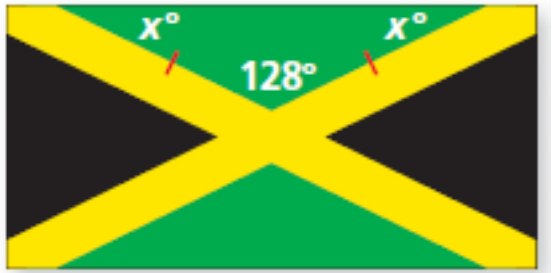
b. Flag of Cuba

$$x + x + 60 = 180$$
$$2x + 60 = 180$$
$$2x = 120$$
$$x = 60$$

EXAMPLE 2 Finding Angle Measures

Find each value of x. Then classify each triangle.

a. Flag of Jamaica



$$x + x + 128 = 180$$
$$2x + 128 = 180$$
$$2x = 52$$
$$x = 26$$

∴ The value of x is 26. The triangle has one obtuse angle and two congruent sides. So, it is an obtuse isosceles triangle.

b. Flag of Cuba

$$x + x + 60 = 180$$
$$2x + 60 = 180$$
$$2x = 120$$
$$x = 60$$

∴ The value of x is 60. All three angles are congruent. So, it is an equilateral and equiangular triangle.