

Practice with Examples

For use with pages 194–201

GOAL

Classify triangles by their sides and angles and find angle measures in triangles

VOCABULARY

A **triangle** is a figure formed by three segments joining three non-collinear points.

An **equilateral triangle** has three congruent sides.

An **isosceles triangle** has at least two congruent sides.

A **scalene triangle** has no congruent sides.

An **acute triangle** has three acute angles.

An **equiangular triangle** has three congruent angles.

A **right triangle** has one right angle.

An **obtuse triangle** has one obtuse angle.

The three angles of a triangle are the **interior angles**.

When the sides of a triangle are extended, the angles that are adjacent to the interior angles are **exterior angles**.

Theorem 4.1 Triangle Sum Theorem

The sum of the measures of the interior angles of a triangle is 180° .

Theorem 4.2 Exterior Angle Theorem

The measure of an exterior angle of a triangle is equal to the sum of the measures of the two nonadjacent interior angles.

Corollary to the Triangle Sum Theorem

The acute angles of a right triangle are complementary.

Practice with Examples

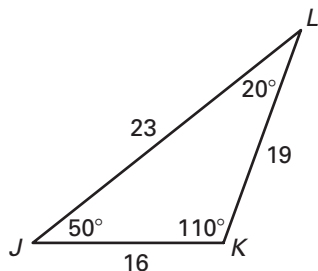
For use with pages 194–201

EXAMPLE 1

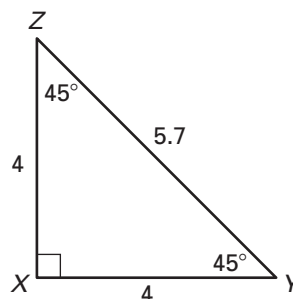
Classifying Triangles

Classify the triangles by their sides and angles.

a.



b.



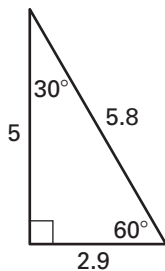
SOLUTION

- a. $\triangle JKL$ has one obtuse angle and no congruent sides. It is an obtuse scalene triangle.
- b. $\triangle XYZ$ has one right angle and two congruent sides. It is a right isosceles triangle.

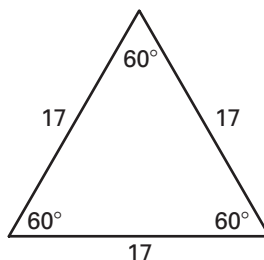
Exercises for Example 1

Classify the triangle by its sides and angles.

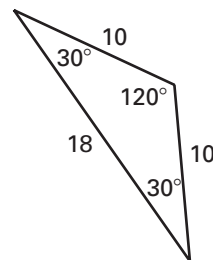
1.



2.



3.

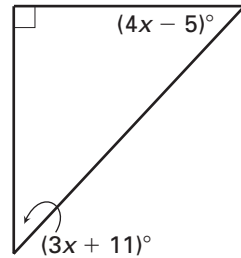


Practice with Examples

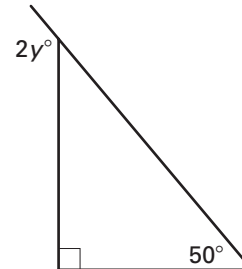
For use with pages 194–201

EXAMPLE 2 Finding Angle Measures

- a. Find the value of x .



- b. Find the value of y .



SOLUTION

- a. From the Corollary to the Triangle Sum Theorem, you can write and solve an equation to find the value of x .

$$(4x - 5)^\circ + (3x + 11)^\circ = 90^\circ$$

The acute angles of a right triangle are complementary.

$$x = 12$$

Solve for x .

- b. You can apply the Exterior Angle Theorem to write and solve an equation that will allow you to find the value of y .

$$90^\circ + 50^\circ = 2y^\circ$$

Apply the Exterior Angle Theorem.

$$y = 70$$

Solve for y .

Exercises for Example 2

Find the value of x .

