✓ GUIDED PRACTICE for Examples 1, 2, and 3

Solve △*ABC*.

1. $a = 8, c = 10, B = 48°$

2. $a = 14, b = 16, c = 9$

3. WHAT IF? In Example 3, suppose that $a = 193$ cm, $b = 335$ cm, and $c = 186$ cm. Find the step angle θ.

HERON'S AREA FORMULA The law of cosines can be used to establish the following formula for the area of a triangle. The formula is credited to the Greek mathematician Heron (circa A.D. 100).

KEY CONCEPT *For Your Notebook*

Heron's Area Formula

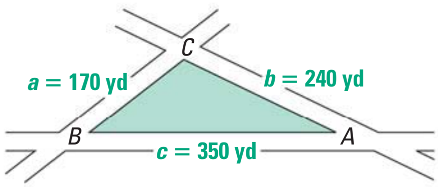
The area of the triangle with sides of length a, b, and c is

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

where $s = \frac{1}{2}(a + b + c)$. The variable s is called the *semiperimeter*, or half-perimeter, of the triangle.

EXAMPLE 4 TAKS REASONING: Multi-Step Problem

URBAN PLANNING The intersection of three streets forms a piece of land called a traffic triangle. Find the area of the traffic triangle shown.



ANOTHER WAY
For an alternative method for solving the problem in Example 4, turn to page 895 for the **Problem Solving Workshop**.

Solution

STEP 1 **Find** the semiperimeter s.

$$s = \frac{1}{2}(a + b + c) = \frac{1}{2}(170 + 240 + 350) = 380$$

STEP 2 **Use** Heron's formula to find the area of △*ABC*.

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

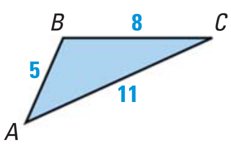
$$= \sqrt{380(380-170)(380-240)(380-350)} \approx 18{,}300$$

▶ The area of the traffic triangle is about 18,300 square yards.

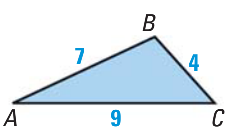
✓ GUIDED PRACTICE for Example 4

Find the area of △*ABC*.

4.



5.



6.