

## Section 5.7 Law of Cosines

**Objective:** In this lesson you learned how to use the Law of Cosines to solve oblique triangles and to use Heron's Formula to find the area of a triangle.

Course Number

Instructor

Date

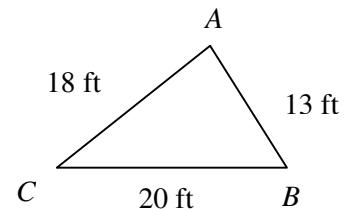
### I. Introduction (Pages 428–429)

State the **Law of Cosines**.

***What you should learn***

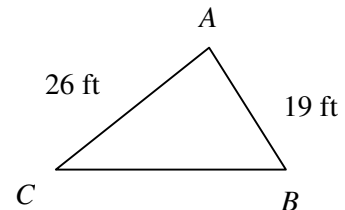
How to use the Law of Cosines to solve oblique triangles (SSS or SAS)

**Example 1:** Using the triangle shown at the right, find angle  $A$ .



When given the lengths of all three sides of a triangle and asked to find all three angles, which angle should be found first? Why?

**Example 2:** In the triangle shown at the right, if  $A = 62^\circ$ , find the length of side  $a$ .



### II. Applications of the Law of Cosines (Page 430)

Describe a real-life situation in which the Law of Cosines could be used.

***What you should learn***

How to use the Law of Cosines to model and solve real-life problems

**III. Heron’s Area Formula** (Page 431)

Heron’s Area Formula states that given any triangle with sides of length  $a$ ,  $b$ , and  $c$ , the area of the triangle is:

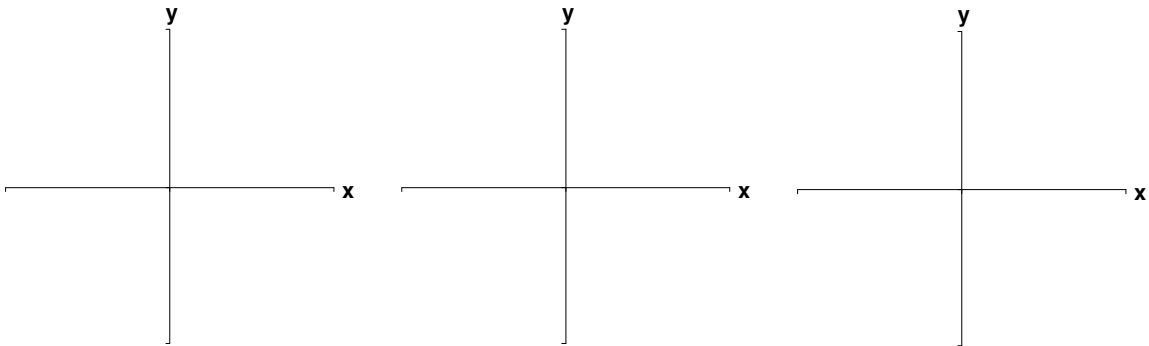
$$\text{Area} = \sqrt{\frac{a+b+c}{2} \left( \frac{a+b+c}{2} - a \right) \left( \frac{a+b+c}{2} - b \right) \left( \frac{a+b+c}{2} - c \right)}$$

where  $s = \frac{a+b+c}{2}$ .

**Example 3:** Find the area of a triangle having sides of length  $a = 14$  cm,  $b = 21$  cm, and  $c = 27$  cm.

*What you should learn*  
 How to use Heron’s Area Formula to find the area of a triangle

**Additional notes**



**Homework Assignment**

Page(s)

Exercises