

## Section 4.8 Applications and Models

**Objective:** In this lesson you learned how to use trigonometric functions to solve real-life problems.

Course Number

Instructor

Date

**Important Vocabulary** Define each term or concept.

**Simple harmonic motion**

### I. Applications Involving Right Triangles (Pages 353–354)

**Example 1:** A ladder leaning against a house reaches 24 feet up the side of the house. The ladder makes a  $60^\circ$  angle with the ground. How far is the base of the ladder from the house? Round your answer to two decimal places.

*What you should learn*  
How to solve real-life problems involving right triangles

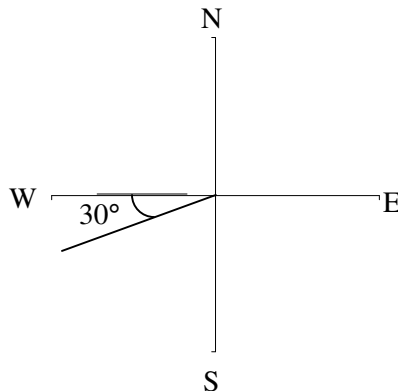
### II. Trigonometry and Bearings (Page 355)

In surveying and navigation, a directional **bearing** measures . . .

*What you should learn*  
How to solve real-life problems involving directional bearings

The bearing N  $70^\circ$  E means . . .

**Example 2:** Write the bearing for the path shown in the diagram below.



**III. Harmonic Motion** (Pages 356–358)

A point that moves on a coordinate line is said to be in simple harmonic motion if . . .

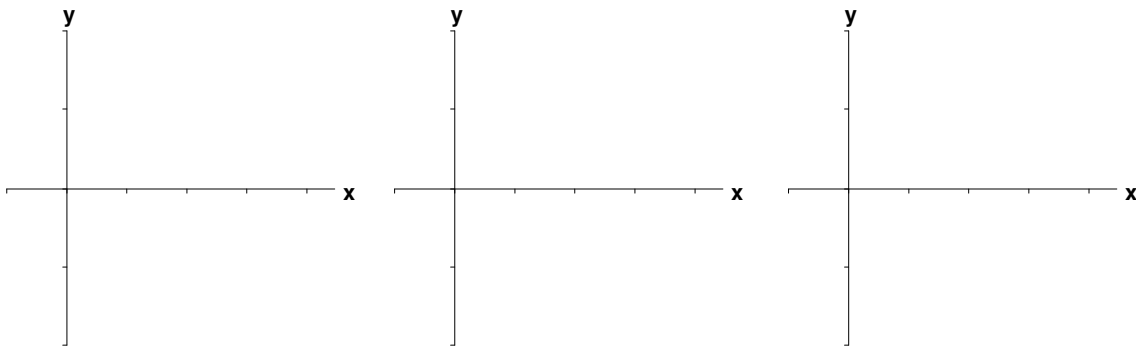
*What you should learn*  
 How to solve real-life problems involving harmonic motion

The simple harmonic motion has amplitude \_\_\_\_\_, period \_\_\_\_\_, and frequency \_\_\_\_\_.

**Example 3:** Given the equation for simple harmonic motion

$$d = 3 \sin \frac{t}{2}, \text{ find:}$$

- (a) the maximum displacement,
- (b) the frequency of the simple harmonic motion, and
- (c) the period of the simple harmonic motion.



**Homework Assignment**

Page(s)

Exercises