3. Name another angle between 0° and 360° with the same cosine as 40°.

4. Give each of the following in terms of the sine of a reference angle.
   a. sin 170° b. sin 330° c. sin (−15°) d. sin 400°

5. Give each of the following in terms of the cosine of a reference angle.
   a. cos 160° b. cos 182° c. cos (−100°) d. cos 365°

Use a calculator or table to find the value of each expression to four decimal places.

6. a. sin 188° b. sin (−110°) c. cos 350° d. cos (−230°)
7. a. cos 10.2° b. sin 28.6° c. sin (−54.7°) d. cos (−32.1°)
8. a. sin 3 b. cos 4 c. sin (−1) d. cos (−2)
9. a. cos 2.5 b. cos (−0.73) c. sin (−3.4) d. sin 0.39

Study the sine and cosine values of 30°, 45°, and 60°. Then give the exact value of each expression in simplest radical form.

10. a. sin 45° b. sin 135° c. sin 225° d. sin 315°
11. a. cos 60° b. cos 120° c. cos 240° d. cos 300°
12. a. sin 30° b. sin (−30°) c. cos 30° d. cos (−30°)
13. a. sin 330° b. cos 330° c. $\sin \frac{7\pi}{6}$ d. $\cos \frac{7\pi}{6}$
14. a. $\cos \frac{\pi}{4}$ b. $\sin\left(-\frac{\pi}{3}\right)$ c. $\cos \frac{5\pi}{6}$ d. sin (−300°)

15. For the graphs of the sine and cosine functions shown on the preceding page, the θ-axis is labeled in degrees. Redraw each graph, labeling the θ-axis in radians this time. (Your labels should be in terms of π.)

16. ***Visual Thinking*** Explain how translating the cosine graph can be used to justify the fact that for all θ:
$$\cos(\theta - 90°) = \sin\theta$$

17. a. What symmetry does the graph of the sine function have?
    b. What symmetry does the graph of the cosine function have?

18. Use Exercise 16 and part (b) of Exercise 17 to justify the fact that for all θ:
$$\cos(90° - \theta) = \sin\theta$$

WRITTEN EXERCISES

Express each of the following in terms of a reference angle.

A
1. a. sin 128° b. cos 128° c. sin (−37°) d. cos 500°
2. a. sin 310° b. cos 310° c. cos (−53°) d. sin 1000°
3. a. cos 224.5° b. cos 658° c. sin 145.7° d. sin (−201°)
4. a. cos 107.9° b. sin 271.3° c. sin 834° d. cos (−132°)