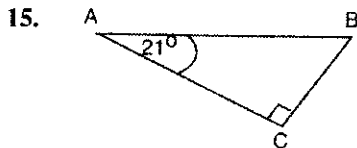


14.  $\cot \theta = 5.937006$

14. \_\_\_\_\_

Solve each of the following right triangles. The right angle is at  $C$ .



15. \_\_\_\_\_

16.  $b = 610, c = 750$

16. \_\_\_\_\_

17.  $A = 42^\circ, a = 49.2$

17. \_\_\_\_\_

18. An observer is located at the origin of a coordinate system. Find the bearing of an object located at the point  $(-3, 3)$ .

18. \_\_\_\_\_

19. From a point 250 ft from the base of a tower, the angle of elevation to the top of the tower is  $18.5^\circ$ . How tall is the tower?

19. \_\_\_\_\_

20. From a point 5.0 miles due north of a radio antenna, a hiker walks 2.0 mi west. The antenna is now  $S 23^\circ E$  of the hiker. How far is the hiker from the antenna now?

20. \_\_\_\_\_

*A calculator may be used for Problems 11-20.*

Find a decimal approximation for each.

11.  $\cos 109^\circ 52'$

11. \_\_\_\_\_

12.  $\csc 73.56^\circ$

12. \_\_\_\_\_

Find an angle  $\theta$  in the interval  $[0^\circ, 90^\circ)$  that satisfies each statement. Give answers to the nearest tenth of a degree.

13.  $\cos \theta = .8910$

13. \_\_\_\_\_

Do not use a calculator for Problems 1-11.

1. Which of the following describes the measures of all angles that are coterminal with the angle whose measure is  $\frac{\pi}{6}$  radian? (Assume  $n$  is any integer.)

- a.  $\frac{2n\pi}{6}$                       b.  $\frac{\pi}{6} + 2n$   
 c.  $\frac{\pi}{6} + 2\pi n$                 d. None of these

Convert each of the following degree measures to radians. Leave answers as multiples of  $\pi$ .

2.  $110^\circ$   
 3.  $300^\circ$   
 4.  $125^\circ$

Convert each of the following radian measures to degrees.

5.  $-\frac{5\pi}{18}$   
 6.  $\frac{8\pi}{3}$   
 7.  $\frac{2\pi}{3}$

Evaluate each of the following. Give exact values.

8.  $\sin \frac{4\pi}{3}$   
 9.  $\sec \frac{\pi}{4}$   
 10.  $\tan \frac{7\pi}{3}$

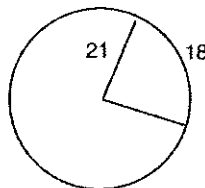
Solve the problem.

19. Find the linear velocity of a point on the edge of a wheel rotating 35 times per minute. The diameter of the wheel is 3.0 m.  
 20. A pulley has a radius of 14.50 cm. It takes 15 sec for 40 cm of belt to go around the pulley. Find the angular velocity of the pulley in radians per sec.

11. Give the exact value of  $s$  in the interval  $\left[\pi, \frac{3\pi}{2}\right]$  such that  $\cos s = -\frac{\sqrt{2}}{2}$ .

Use a calculator as necessary in Problems 12-20.

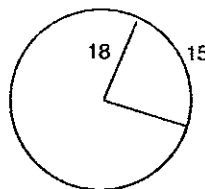
12. Find the measure, to the nearest degree, of the acute central angle in the figure below.



13. Explain what would happen to the measure of the central angle in the figure above if the radius were doubled (and the arc length remained unchanged).  
 14. Find the area of a sector of a circle intercepted by a central angle of  $150^\circ$  in a circle of radius 5.3 cm.

Use a calculator to find the following.

15.  $\sin 1.2275$   
 16.  $\sec .8902$   
 17. Find the value of  $s$  in the interval  $\left[0, \frac{\pi}{2}\right]$  such that  $\tan s = .790325578$ .  
 18. Find the measure, to the nearest degree, of the acute central angle in the figure below.



19. \_\_\_\_\_  
 20. \_\_\_\_\_

**CHAPTER 4, FORM A**  
**TRIGONOMETRY**

NAME \_\_\_\_\_  
DATE \_\_\_\_\_

1. Which one of the six trigonometric functions has a period of  $\pi$  and passes through the point  $(0, 0)$ ?
2. Give all of the basic trigonometric functions that satisfy the condition: the range is  $(-\infty, \infty)$ .
3. Use the ranges to explain why the secant function can attain the value of 2 but the cosine function cannot.
4. True or false:  $y = 3 \cot x$  and  $y = \frac{1}{4 \tan x}$  have the same graph.
5. What is the minimum value of  $y = 3 + \cos 2x$ ?
6. Which of the following is the equation of the cosine function with amplitude 4 and period  $\pi$ ?
  - a.  $y = 2 \cos 2x$
  - b.  $y = 4 \cos (x + 2)$
  - c.  $y = 2 \cos 4x$
  - d.  $y = 4 \cos 2x$

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

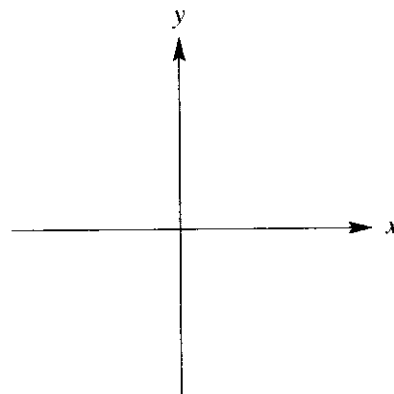
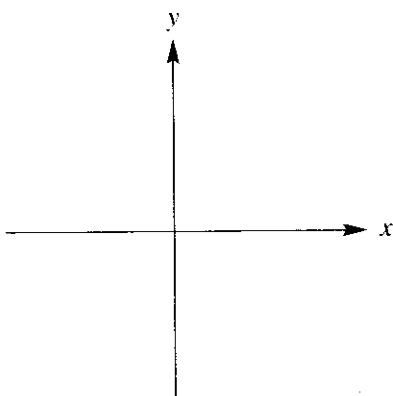
For each defined function, give the amplitude, period, vertical translation, and phase shift, as applicable.

7.  $y = -3 \sin x$
8.  $y = \cos 2x + 3$
9.  $y = \sec \left( x + \frac{\pi}{2} \right)$
10.  $y = 3 - \tan 2x$
11.  $y = 3 \cos 2 \left( x - \frac{\pi}{4} \right)$
12.  $y = 4 - \frac{3}{4} \sin (3x - \pi)$

7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_

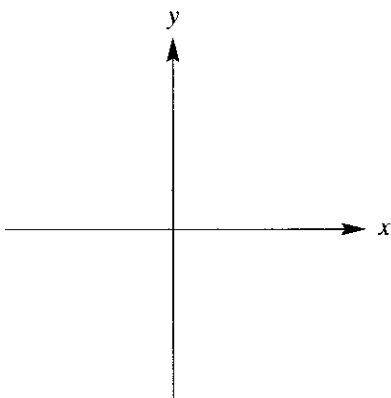
19.  $y = \tan \left( \frac{x}{2} + \frac{\pi}{4} \right)$

20.  $y = -2 + \frac{1}{2} \cos (2x - \pi)$

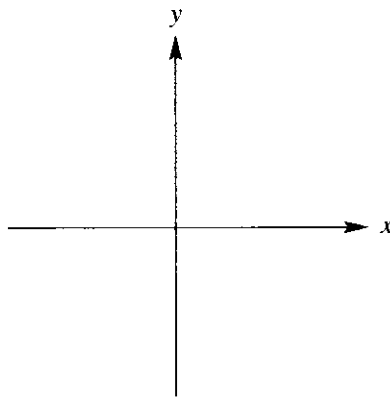


Graph each defined function over a one-period interval.

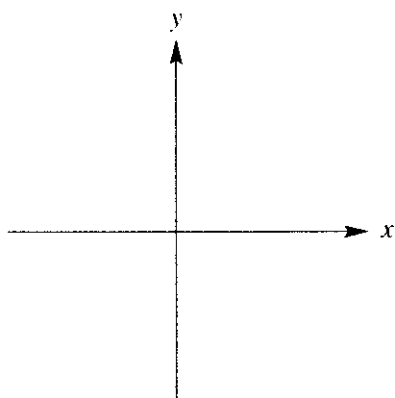
13.  $y = 5 \sin x$



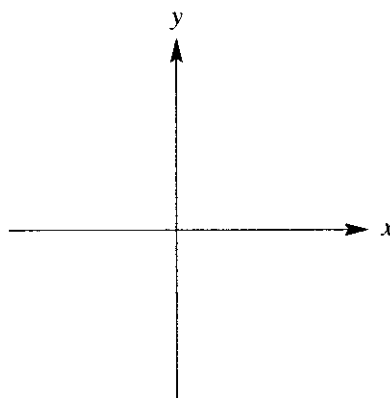
14.  $y = 3 - 2 \cos x$



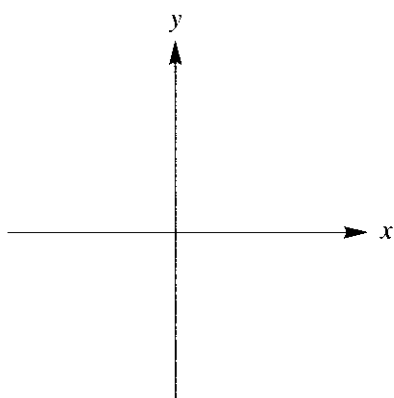
15.  $y = \frac{1}{4} \sec x$



16.  $y = 3 \tan x$



17.  $y = -\sin\left(x + \frac{\pi}{2}\right)$



18.  $y = \csc\left(2x + \frac{\pi}{2}\right)$

