

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

**Find functions f and g so that  $F(x) = (f \circ g)(x)$ .**

1)  $F(x) = \frac{10}{\sqrt{4x+2}}$  1) \_\_\_\_\_

A)  $f(x) = \frac{10}{x}$ ,  $g(x) = 4x + 2$

B)  $f(x) = 10$ ,  $g(x) = \sqrt{4+2}$

C)  $f(x) = \frac{10}{\sqrt{x}}$ ,  $g(x) = 4x + 2$

D)  $f(x) = \sqrt{4x+2}$ ,  $g(x) = 10$

2)  $F(x) = (-7x + 18)^3$  2) \_\_\_\_\_

A)  $f(x) = -7x + 18$ ,  $g(x) = x^3$

B)  $f(x) = x^3$ ,  $g(x) = -7x + 18$

C)  $f(x) = -7x^3$ ,  $g(x) = x + 18$

D)  $f(x) = (-7x)^3$ ,  $g(x) = 18$

**Write the standard equation for the circle.**

3) Center at (24, 5), passing through (24, 0) 3) \_\_\_\_\_

A)  $(x - 24)^2 + (y - 5)^2 = 25$

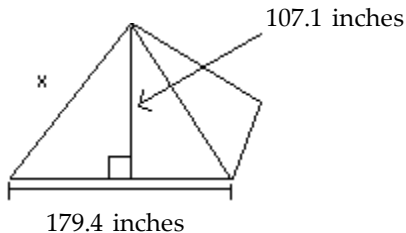
B)  $(x - 5)^2 + (y - 24)^2 = 576$

C)  $(x - 5)^2 + (y - 24)^2 = 5$

D)  $(x - 24)^2 + (y - 5)^2 = 576$

**Solve the problem.**

- 4) A pyramid was constructed for a mini golf center which featured the man-made wonders of the world. The pyramid is depicted in the figure below. Find the length x of a slant edge of the pyramid. Round your answer to the nearest hundredth. 4) \_\_\_\_\_



A) 19,516.50 inches

B) 208.94 inches

C) 58.52 inches

D) 139.70 inches

**Find the inverse of the function.**

5)  $f(x) = 7x + 8$  5) \_\_\_\_\_

A)  $f^{-1}(x) = \frac{x}{7} - 8$

B)  $f^{-1}(x) = \frac{x-8}{7}$

C)  $f^{-1}(x) = \frac{x+8}{7}$

D) Not invertible

**Find the inverse using composition.**

6)  $f(x) = (x + 15)^2 - 1$ ,  $x \geq -15$  6) \_\_\_\_\_

A)  $f^{-1}(x) = 1x^2 + 15$

B)  $f^{-1}(x) = \sqrt{x+1} - 15$

C)  $f^{-1}(x) = \sqrt{x-1} + 15$

D)  $f^{-1}(x) = \sqrt{x+15} + 1$

For the given pair of variables determine whether a is a function of b, b is a function of a, both, or neither.

7) a is the savings account number of a customer at a bank, and b is the number of years the account has been active. 7) \_\_\_\_\_

- A) a is a function of b  
 B) Neither  
 C) b is a function of a  
 D) Both

Find the inverse of the function.

8)  $f(x) = \sqrt[3]{\frac{x}{5}} - 2$  8) \_\_\_\_\_

- A)  $f^{-1}(x) = 15(x + 2)$   
 B)  $f^{-1}(x) = 5(x^3 + 2)$   
 C)  $f^{-1}(x) = [5(x + 2)]^3$   
 D)  $f^{-1}(x) = 5(x + 2)^3$

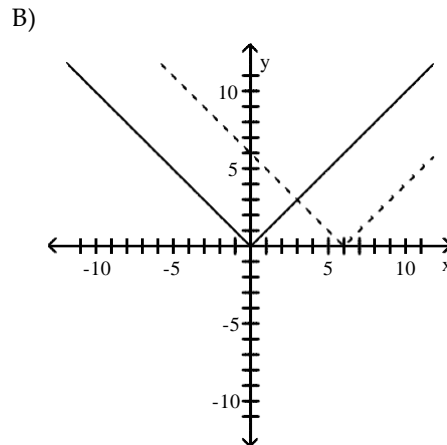
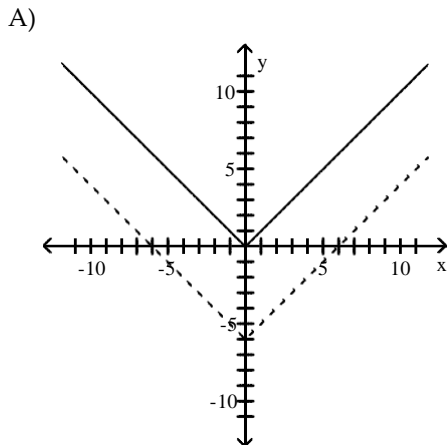
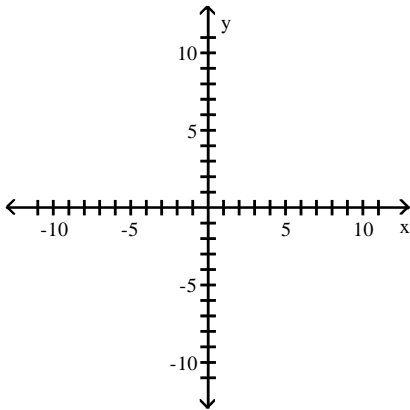
Find the inverse using composition.

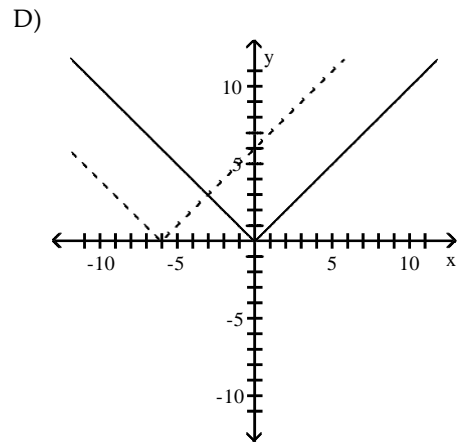
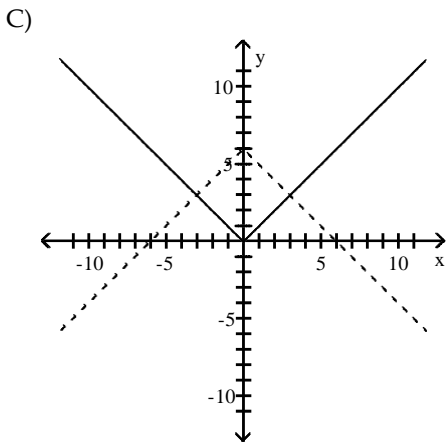
9)  $f(x) = x^2 - 18, x \geq 0$  9) \_\_\_\_\_

- A)  $f^{-1}(x) = \sqrt{x - 18}$   
 B)  $f^{-1}(x) = x^2 + 18$   
 C)  $f^{-1}(x) = \sqrt{x^2 + 18}$   
 D)  $f^{-1}(x) = \sqrt{x + 18}$

Graph the pair of functions on the same plane. Use a dashed line for g(x).

10)  $f(x) = |x|, g(x) = |x - 6|$  10) \_\_\_\_\_

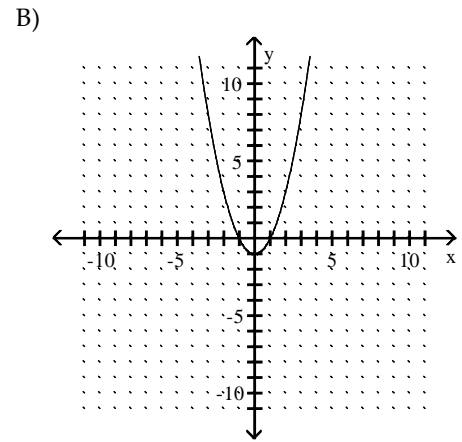
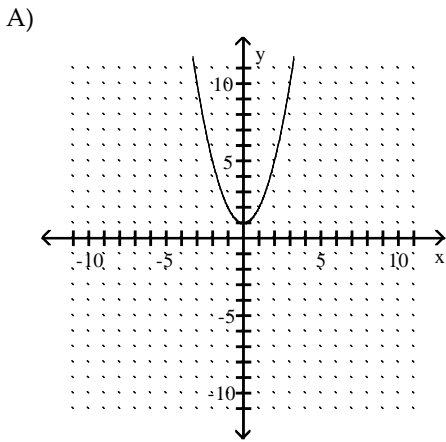
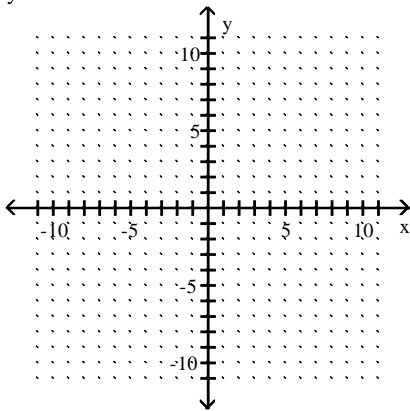




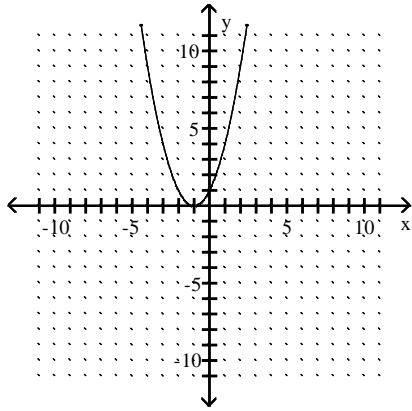
Graph the equation.

11)  $y = x^2 + 1$

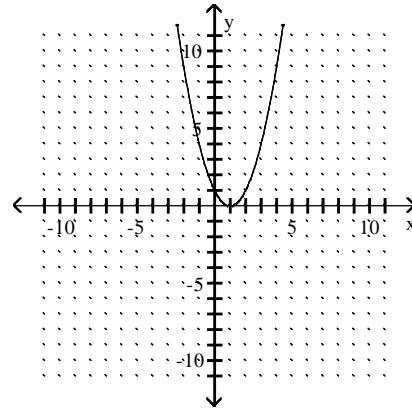
11) \_\_\_\_\_



C)



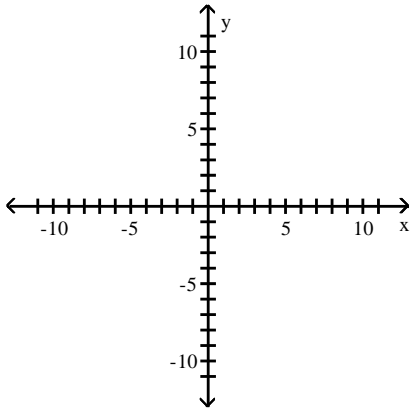
D)



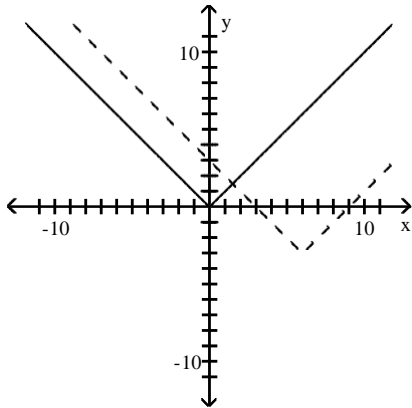
Graph the pair of functions on the same plane. Use a dashed line for  $g(x)$ .

12)  $f(x) = x^2$ ,  $g(x) = (x - 6)^2 - 3$

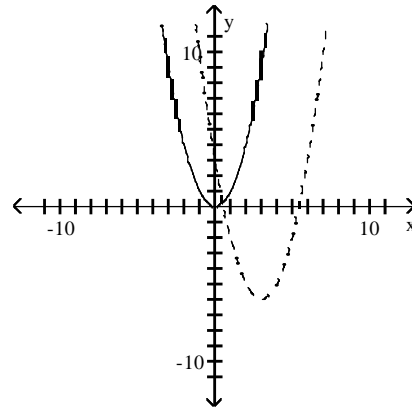
12) \_\_\_\_\_



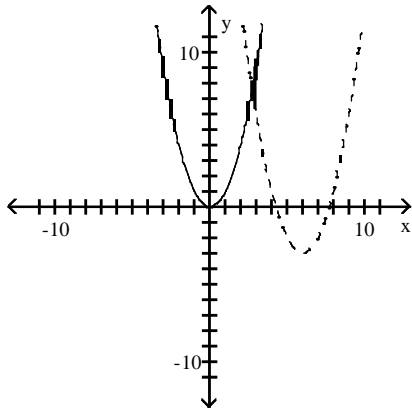
A)



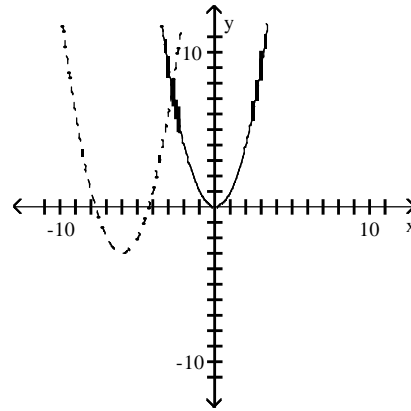
B)



C)



D)



Find the inverse of the function.

13)  $f(x) = \sqrt{x - 9}$  for  $x \geq 9$

A)  $f^{-1}(x) = x + 9$

B)  $f^{-1}(x) = x^2 - 9$

C)  $f^{-1}(x) = x^2 + 9$

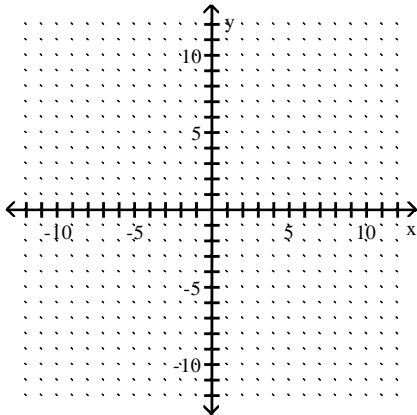
D) Not invertible

13) \_\_\_\_\_

Use one or more transformations to graph the function.

14)  $y = |x - 5| - 3$

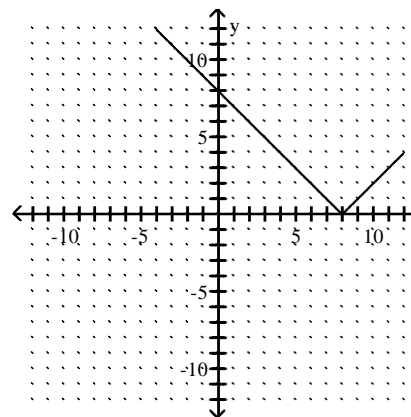
14) \_\_\_\_\_

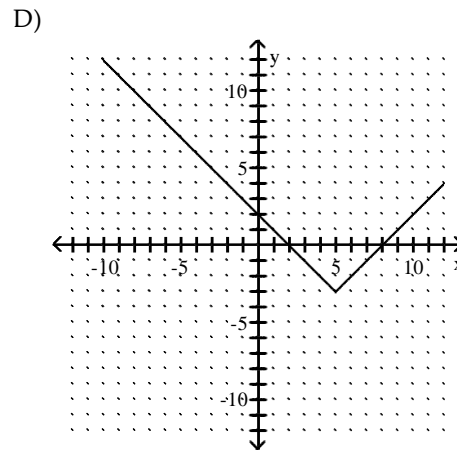
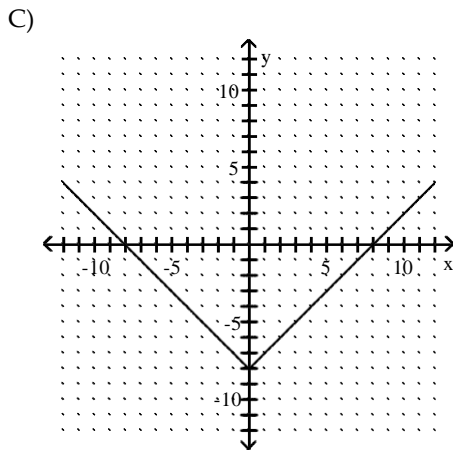


A)



B)





Find the angle of smallest possible positive measure that is coterminal with the given angle.

- 15)  $-350^\circ$  15) \_\_\_\_\_  
 A)  $350^\circ$                       B)  $10^\circ$                       C)  $190^\circ$                       D)  $-170^\circ$

Solve the problem.

- 16) Find the acute angle  $\alpha$  (in degrees) that satisfies the equation  $\alpha = \tan^{-1}(1)$ . 16) \_\_\_\_\_  
 A)  $90^\circ$                       B)  $45^\circ$                       C)  $0^\circ$                       D)  $180^\circ$

Perform the calculation. Express the answer in degree-minutes-seconds format.

- 17)  $94^\circ 39' + 110^\circ 50'$  17) \_\_\_\_\_  
 A)  $30^\circ 29'$                       B)  $30^\circ 89'$                       C)  $205^\circ 89'$                       D)  $205^\circ 29'$

Perform the indicated operation.

- 18)  $-\frac{\pi}{8} + 2\pi$  18) \_\_\_\_\_  
 A)  $\frac{\pi}{8}$                       B)  $-\frac{6\pi}{8}$                       C)  $-\frac{\pi}{8}$                       D)  $-\frac{3\pi}{8}$

Convert the radian measure to degree measure. Use the value of  $\pi$  found on a calculator and round answers to two decimal places.

- 19)  $-\frac{\pi}{6}$  19) \_\_\_\_\_  
 A)  $\left(-\frac{\pi}{6}\right)^\circ$                       B)  $-0.52^\circ$                       C)  $-30\pi^\circ$                       D)  $-30^\circ$

Find the exact value of the expression. Do not use a calculator.

- 20)  $10 \cos \theta$ , if  $\theta = 45^\circ$  20) \_\_\_\_\_  
 A)  $5\sqrt{2}$                       B)  $-10\sqrt{2}$                       C)  $10\sqrt{2}$                       D)  $-5\sqrt{2}$

Convert the angle to decimal degrees and round to the nearest hundredth of a degree.

21)  $47^{\circ}47'12''$

A)  $47.75^{\circ}$

B)  $47.80^{\circ}$

C)  $47.85^{\circ}$

D)  $47.79^{\circ}$

21) \_\_\_\_\_

Find the exact value of the following expression without using a calculator.

22)  $\tan 60^{\circ}$

A) 2

B)  $\sqrt{3}$

C)  $\frac{\sqrt{3}}{3}$

D)  $\frac{\sqrt{3}}{2}$

22) \_\_\_\_\_

Find the exact value of the expression.

23)  $\cos 360^{\circ} - 4 \sin 90^{\circ}$

A) -3

B) -4

C) 1

D) 0

23) \_\_\_\_\_

Use a calculator to find the function value to four decimal places.

24)  $\cos (-696^{\circ})$

A) 0.5878

B) 0.4067

C) 0.9945

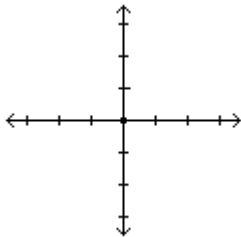
D) 0.9135

24) \_\_\_\_\_

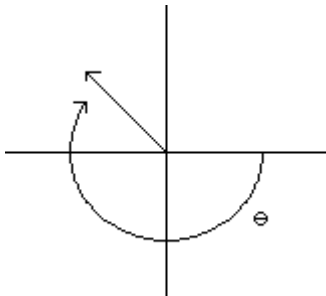
Draw the angle having the given radian measure.

25)  $-\frac{4\pi}{3}$

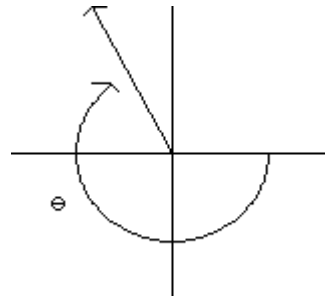
25) \_\_\_\_\_



A)



B)



Find the angle of smallest possible positive measure that is coterminal with the given angle.

26)  $390^{\circ}$

A)  $210^{\circ}$

B)  $30^{\circ}$

C)  $20^{\circ}$

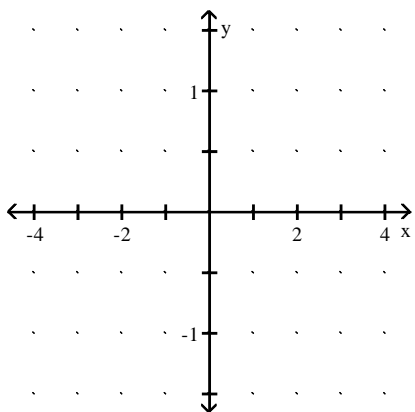
D)  $195^{\circ}$

26) \_\_\_\_\_

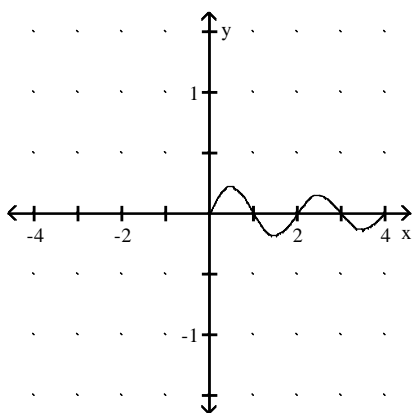
Graph the function on the indicated interval.

27)  $y = \frac{\sin [\pi(x+4)]}{x+4}, 0 \leq x \leq 4$

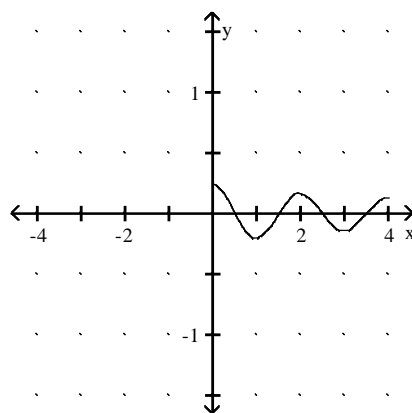
27) \_\_\_\_\_



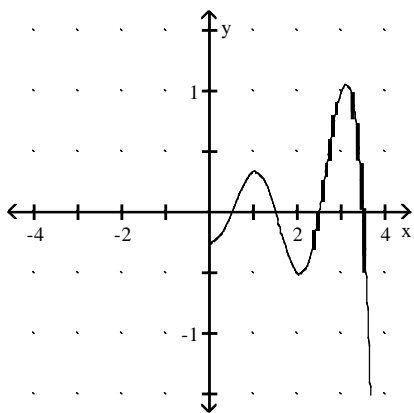
A)



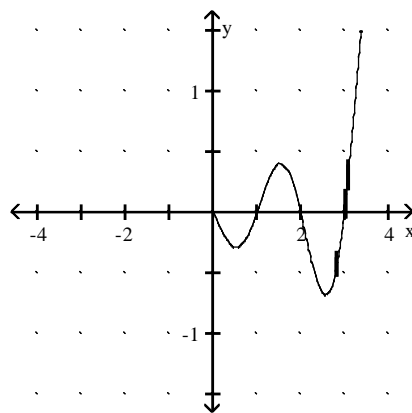
B)



C)



D)



Find the exact value of the trigonometric function.

28)  $\tan \left( -\frac{2\pi}{3} \right)$

28) \_\_\_\_\_

A)  $-\frac{\sqrt{3}}{3}$

B)  $\frac{\sqrt{3}}{3}$

C)  $-\sqrt{3}$

D)  $\sqrt{3}$



29)  $\sin \frac{5\pi}{6}$

29) \_\_\_\_\_

A)  $-\frac{\sqrt{2}}{2}$

B)  $\frac{1}{2}$

C)  $-\frac{\sqrt{3}}{2}$

D)  $\frac{\sqrt{3}}{2}$

**Find the equation for the curve in its final position.**

30) The graph  $y = \sin(x)$  is shifted a distance of  $\pi/12$  to the left, reflected in the x-axis, translated 5 units downward, then stretched by a factor of 4.

30) \_\_\_\_\_

A)  $y = -4 \sin \left( x + \frac{\pi}{12} \right) - 20$

B)  $y = -4 \sin \left( x - \frac{\pi}{12} \right) - 20$

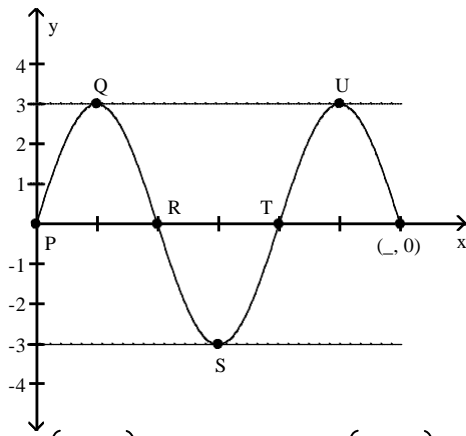
C)  $y = -4 \sin \left( x + \frac{\pi}{12} \right) - 5$

D)  $y = -4 \sin \left( x - \frac{\pi}{12} \right) + 20$

**Determine the coordinates of the specified point.**

31) Point U

31) \_\_\_\_\_



A)  $\left( \frac{5\pi}{3}, 3 \right)$

B)  $\left( \frac{5\pi}{6}, 3 \right)$

C)  $\left( \frac{5\pi}{6}, 0 \right)$

D)  $\left( \frac{5\pi}{3}, 0 \right)$

**Find the phase shift of the function.**

32)  $y = \cos \left( x - \frac{\pi}{2} \right)$

32) \_\_\_\_\_

A)  $\frac{\pi}{2}$

B)  $-\frac{\pi}{2}$

C)  $2\pi$

D) 1

**Solve the problem.**

33) Find the coordinates of  $(\pi/3, -3)$  after it is moved  $\pi/3$  units to the left.

33) \_\_\_\_\_

A)  $(2\pi/3, -3)$

B)  $(\pi, -3)$

C)  $(-2\pi/3, -3)$

D)  $(0, -3)$

**Find the amplitude, period, or phase shift as specified.**

34) Find the amplitude of  $y = -5 \cos(3x - \pi)$ .

34) \_\_\_\_\_

A) -15

B) -3

C) 5

D)  $\pi$

Find the exact value of the trigonometric function.

35)  $\cot \frac{-5\pi}{6}$

35) \_\_\_\_\_

A)  $\sqrt{3}$

B)  $-\frac{\sqrt{3}}{3}$

C)  $\frac{\sqrt{3}}{3}$

D)  $-\sqrt{3}$

Determine the period of the function.

36)  $y = \tan \frac{9\pi}{4}$

36) \_\_\_\_\_

A) 1

B) -1

C)  $\frac{\sqrt{3}}{3}$

D)  $\sqrt{3}$

Decide whether the expression is or is not an identity.

37)  $\tan (A + 2\pi) = -\tan A$

37) \_\_\_\_\_

A) Not an identity

B) Identity

38)  $\csc \frac{\theta}{2} \sec \frac{\theta}{2} = \csc \theta$

38) \_\_\_\_\_

A) Not an identity

B) Identity

Find the exact value of the expression.

39)  $\frac{\pi}{4} - \frac{\pi}{6}$

39) \_\_\_\_\_

A)  $\frac{\pi}{10}$

B)  $\frac{1}{12\pi}$

C)  $\frac{\pi}{12}$

D)  $12\pi$

Multiply and simplify.

40)  $\sec x (\cot x + \sin x)$

40) \_\_\_\_\_

A)  $\sin x + \csc x$

B)  $\csc x + \tan x$

C)  $\cos^2 x + 2 \sin^2 x$

D)  $\cos^2 x - \cot x$

Using a sum or difference identity, write the following as an expression involving functions of  $\alpha$ .

41)  $\tan \left( \alpha + \frac{\pi}{6} \right)$

41) \_\_\_\_\_

A)  $\frac{1 + \sqrt{3} \tan \alpha}{\sqrt{3} - \tan \alpha}$

B)  $-\tan \alpha$

C)  $\frac{\tan \alpha - \sqrt{3}}{1 + \sqrt{3} \tan \alpha}$

D)  $\tan \alpha$

Find the exact value by using a half-angle identity.

42)  $\tan (165^\circ)$

42) \_\_\_\_\_

A)  $2 - \sqrt{3}$

B)  $-2 + \sqrt{3}$

C)  $-2 - \sqrt{3}$

D)  $2 + \sqrt{3}$

Find the exact value of the expression.

43)  $\cos 40^\circ \cos 20^\circ - \sin 40^\circ \sin 20^\circ$

43) \_\_\_\_\_

A)  $\sqrt{3}$

B)  $\frac{1}{2}$

C)  $\frac{\sqrt{3}}{2}$

D)  $\frac{1}{4}$

Express the given trigonometric function in terms of the indicated function.

44)  $\cos \theta$  in terms of  $\csc \theta$

44) \_\_\_\_\_

A)  $\pm \frac{\csc^2 \theta - 1}{\sqrt{\csc \theta}}$

B)  $\frac{1}{\csc \theta}$

C)  $\pm \frac{\csc^2 \theta - 1}{\sqrt{\csc \theta}}$

D)  $\frac{\pm \csc \theta \sqrt{\csc^2 \theta - 1}}{1 + \csc^2 \theta}$

Find the exact value of the product.

45)  $\cos 15^\circ \cos 45^\circ$

45) \_\_\_\_\_

A)  $\frac{\sqrt{2} - \sqrt{3}}{4}$

B)  $\frac{\sqrt{3} - \sqrt{2}}{4}$

C)  $\frac{\sqrt{3}}{2}$

D)  $\frac{\sqrt{3} + 1}{4}$

Find the exact value for  $x$  in the interval  $\left[0, \frac{\pi}{2}\right]$  that satisfies the equation.

46)  $\tan(x) = \frac{\sqrt{3}}{3}$

46) \_\_\_\_\_

A)  $\frac{\pi}{4}$

B)  $\frac{\pi}{2}$

C)  $\frac{\pi}{6}$

D)  $\frac{\pi}{3}$

Find the approximate value of the expression with a calculator. Round your answer to three decimal places.

47)  $\cos^{-1}(-0.3053)$

47) \_\_\_\_\_

A) 5.023

B) 4.402

C) -0.310

D) 1.881

Use a calculator to find the approximate value of the composition. Round your answer to four decimal places. The expression may be undefined.

48)  $\cos\left(4 \arcsin\left(-\frac{\sqrt{2}}{3}\right)\right)$

48) \_\_\_\_\_

A) -0.3827

B) -0.8819

C) 0.8819

D) 0.3827

Find the approximate value of the expression with a calculator. Round your answer to three decimal places.

49)  $\tan^{-1}(-0.7187)$

49) \_\_\_\_\_

A) 2.518

B) -0.623

C) 3.765

D) 2.194

Use a calculator to find the approximate value of the composition. Round your answer to four decimal places. The expression may be undefined.

50)  $\sin(\cos^{-1}(0.8324))$

50) \_\_\_\_\_

A) 0.0175

B) 0.5542

C) 0.6324

D) 0.1389

Find all values of  $x$  in the interval  $[0^\circ, 360^\circ)$  that satisfy the equation. Round approximate answers to the nearest tenth of a degree.

- 51)  $3 \cos^2 x + 2 \cos x = 1$  51) \_\_\_\_\_  
A)  $\{103.2^\circ, 145.2^\circ, 283.2^\circ, 325.2^\circ\}$  B)  $\{49.8^\circ, 130.2^\circ, 229.8^\circ, 310.2^\circ\}$   
C)  $\{51.8^\circ, 128.2^\circ\}$  D)  $\{70.5^\circ, 180^\circ, 289.5^\circ\}$

Find the approximate value of the expression with a calculator. Round your answer to three decimal places.

- 52)  $\sec^{-1}(1.4132)$  52) \_\_\_\_\_  
A) 0.785 B) 5.498 C) 0.863 D) 3.926

Solve the triangle. If there is more than one triangle with the given parts, give both solutions.

- 53)  $\beta = 25.1^\circ$  53) \_\_\_\_\_  
 $b = 6.32$   
 $a = 7.45$   
A) No solution B)  $\alpha = 150.0^\circ, \gamma = 4.9^\circ, c = 1.27$   
C)  $\alpha = 30.0^\circ, \gamma = 124.9^\circ, c = 12.2$  D)  $\alpha = 30.0^\circ, \gamma = 124.9^\circ, c = 12.2;$   
 $\alpha' = 150.0^\circ, \gamma' = 4.9^\circ, c' = 1.27$

Solve the problem.

- 54) A pilot wants to fly on a bearing of  $63.3^\circ$ . By flying due east, he finds that a 51-mph wind, blowing from the south, puts him on course. Find the airspeed of the plane. 54) \_\_\_\_\_  
A) 51 mph B) 101 mph C) 152 mph D) 114 mph

Find the component form for the vector  $\mathbf{v}$  with the given magnitude and direction angle  $\theta$ .

- 55)  $|\mathbf{v}| = 120.2, \theta = 206.9^\circ$  55) \_\_\_\_\_  
A)  $\langle 107.2, 54.4 \rangle$  B)  $\langle -107.2, -54.4 \rangle$  C)  $\langle -107.2, 54.4 \rangle$  D)  $\langle 107.2, -54.4 \rangle$

Solve.

- 56) Two forces of 21 N and 11 N (newtons) act on an object. The angle between the forces is  $36^\circ$ . Find the magnitude of the resultant and the angle that it makes with the larger force. 56) \_\_\_\_\_  
A) 31 N,  $12^\circ$  B) 2 N,  $12^\circ$  C) 30 N,  $17^\circ$  D) 32 N,  $12^\circ$

Find the component form for the vector  $\mathbf{v}$  with the given magnitude and direction angle  $\theta$ .

- 57)  $|\mathbf{v}| = 99.9, \theta = 68.6^\circ$  57) \_\_\_\_\_  
A)  $\langle 36.5, 93 \rangle$  B)  $\langle -36.5, -93 \rangle$  C)  $\langle -93, -36.5 \rangle$  D)  $\langle 93, 36.5 \rangle$

Solve the triangle. If there is more than one triangle with the given parts, give both solutions.

58)  $\beta = 24.22^\circ$   
 $b = 9.93$   
 $a = 12.1$

58) \_\_\_\_\_

A) No solution

B)  $\alpha = 29.99^\circ, \gamma = 125.79^\circ, c = 19.63$

C)  $\alpha = 150.01^\circ, \gamma = 5.77^\circ, c = 2.43$

D)  $\alpha = 29.99^\circ, \gamma = 125.79^\circ, c = 19.63;$   
 $\alpha' = 150.01^\circ, \gamma' = 5.77^\circ, c' = 2.43$

Find the absolute value of the complex number. Round your answer to two decimal places, if necessary.

59)  $3 + \frac{1}{2}i$

59) \_\_\_\_\_

A) 3.04

B) 2.44

C) 9.25

D) 1.87

Write the complex number in the form  $a + bi$ .

60)  $4 \left( \cos \frac{\pi}{2} + i \sin \frac{\pi}{2} \right)$

60) \_\_\_\_\_

A) -4

B) -4i

C) 4

D) 4i

Find the product of the complex number and its conjugate.

61)  $-4 + i\sqrt{11}$

61) \_\_\_\_\_

A) 137

B) 5

C) -105

D) 27

Write the complex number in the form  $a + bi$ .

62)  $4(\cos -135^\circ + i \sin -135^\circ)$

62) \_\_\_\_\_

A)  $-\sqrt{2} - \sqrt{2}i$

B)  $-2\sqrt{2} + 2\sqrt{2}i$

C)  $-2\sqrt{2} - 2\sqrt{2}i$

D)  $-\sqrt{2} + \sqrt{2}i$

Perform the requested evaluation.

63) Given  $P(x) = x^2 - 8x + 20$ , find  $P(4 + 2i)$ .

63) \_\_\_\_\_

A) 4i

B) 4

C) i

D) 0

Write the quotient in the form  $a + bi$ .

64)  $\frac{5 + 7i}{6 + 5i}$

64) \_\_\_\_\_

A)  $\frac{65}{61} + \frac{17}{61}i$

B)  $-\frac{5}{61} - \frac{67}{61}i$

C)  $\frac{65}{11} - \frac{17}{11}i$

D)  $-\frac{5}{11} - \frac{17}{11}i$

Find the inverse of the function.

65)  $f(x) = (x - 19)^2, x \geq 19$

65) \_\_\_\_\_

A)  $f^{-1}(x) = \sqrt{x} + 19$

B)  $f^{-1}(x) = \sqrt{x + 19}$

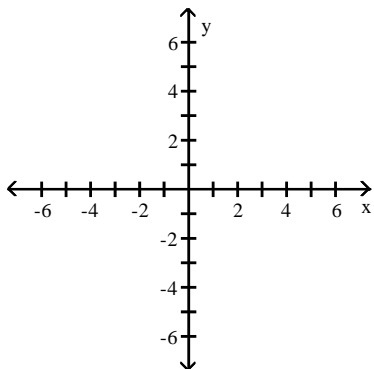
C)  $f^{-1}(x) = -\sqrt{x^2 + 19}$

D)  $f^{-1}(x) = x^2 + 19$

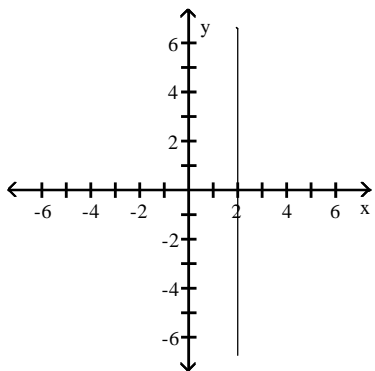
Graph the equation in the rectangular coordinate system.

66)  $x = -2$

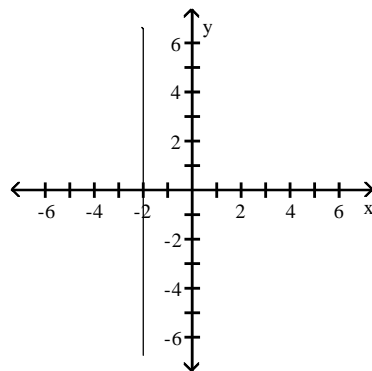
66) \_\_\_\_\_



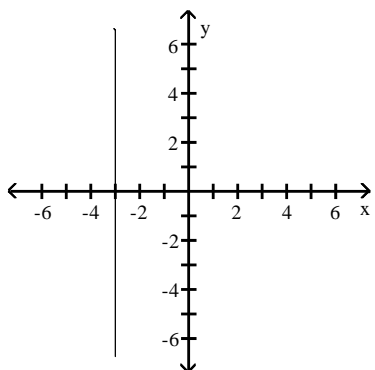
A)



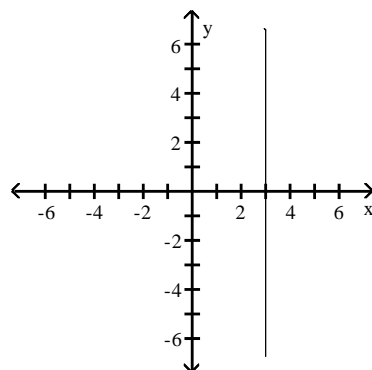
B)



C)



D)



Find the inverse using composition.

67)  $f(x) = x^2 - 2, x \leq 0$

67) \_\_\_\_\_

A)  $f^{-1}(x) = -\sqrt{x+2}$

B)  $f^{-1}(x) = -\sqrt{x^2+2}$

C)  $f^{-1}(x) = x^2 + 2$

D)  $f^{-1}(x) = \sqrt{x+2}$

Use the two given functions to write  $y$  as a function of  $x$ .

68)  $y = -5t + 10, t = 6x - 6$

68) \_\_\_\_\_

A)  $y = -5x + 40$

B)  $y = -30x + 6$

C)  $y = -30x + 40$

D)  $y = -30x + 4$

Find a formula for the inverse of the function described below.

69)  $32^\circ$  Fahrenheit =  $0^\circ$  Celsius. A function that converts temperatures in Celsius to those in Fahrenheit is  $f(x) = \frac{9}{5}x + 32$ . 69) \_\_\_\_\_

A)  $f^{-1}(x) = \frac{5}{9}(x - 32)$

B)  $f^{-1}(x) = \frac{5}{9}(x + 32)$

C)  $f^{-1}(x) = \frac{9}{5}x + 32$

D)  $f^{-1}(x) = x + 32$

Solve the problem.

70) From a boat on the lake, the angle of elevation to the top of a cliff is  $35^\circ 10'$ . If the base of the cliff is 1671 feet from the boat, how high is the cliff (to the nearest foot)? 70) \_\_\_\_\_

A) 1187 ft

B) 1177 ft

C) 1190 ft

D) 1180 ft

Find the exact value of the following expression without using a calculator.

71)  $\csc(\pi/2)$  71) \_\_\_\_\_

A) 1

B) 0

C) -1

D) Undefined

Use reference angles to find the exact value of the expression.

72)  $\sec \frac{3\pi}{4}$  72) \_\_\_\_\_

A)  $-\sqrt{2}$

B) -2

C)  $\frac{\sqrt{2}}{2}$

D)  $-\frac{2\sqrt{3}}{3}$

Given that  $\alpha$  is an angle in standard position whose terminal side contains the given point, provide the exact value of the indicated function.

73)  $(-4, -3)$  Find  $\sec \alpha$ . 73) \_\_\_\_\_

A)  $\frac{3}{4}$

B)  $-\frac{5}{4}$

C)  $-\frac{4}{5}$

D)  $\frac{5}{3}$

Determine the period of the function.

74)  $y = \tan 2t$  74) \_\_\_\_\_

A)  $\pi$

B)  $\frac{\pi}{2}$

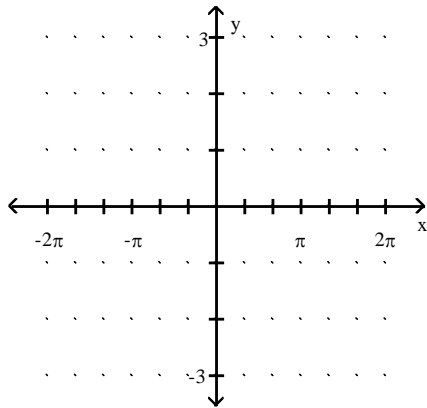
C)  $\frac{3\pi}{2}$

D)  $\frac{\pi}{8}$

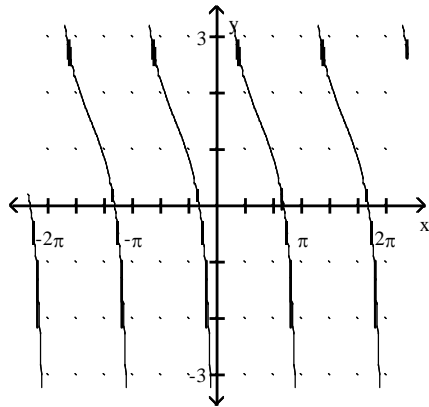
Graph the function.

75)  $y = \frac{6}{5} \cot(x)$

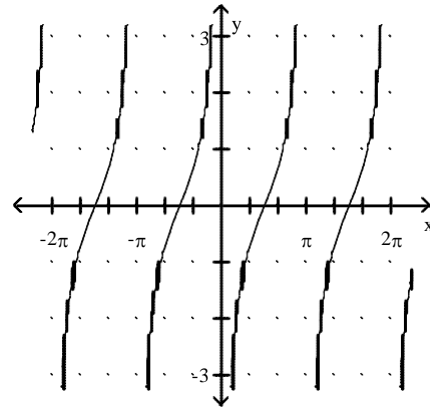
75) \_\_\_\_\_



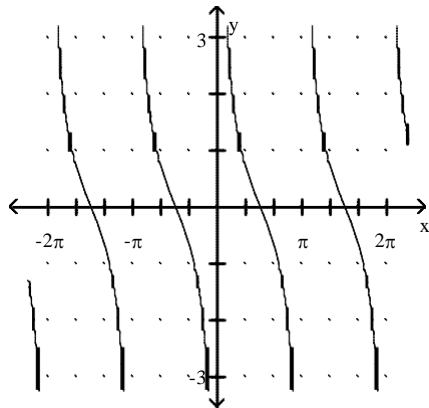
A)



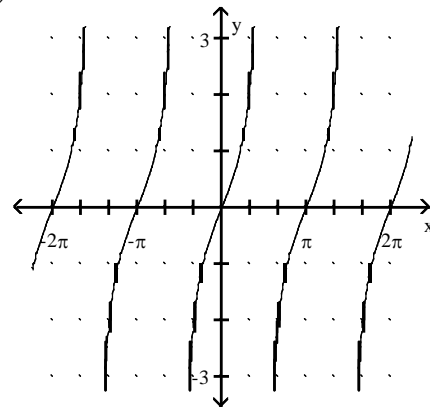
B)



C)



D)



Use a calculator to find the function value to four decimal places.

76)  $\cot(5.16)$

76) \_\_\_\_\_

A) 0.4328

B) 2.3105

C) -2.0828

D) -0.4801



Express the given trigonometric function in terms of the indicated function.

77)  $\sec \theta$  in terms of  $\tan \theta$

77) \_\_\_\_\_

A)  $\frac{1}{\tan \theta}$

B)  $\pm \frac{1 + \tan^2 \theta}{\sqrt{1 + \tan^2 \theta}} \tan \theta$

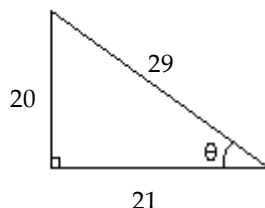
C)  $\frac{\pm \tan \theta}{\sqrt{1 + \tan^2 \theta}}$

D)  $\pm \sqrt{1 + \tan^2 \theta}$

Solve the problem.

78)

78) \_\_\_\_\_



Find the exact value of  $\sin 2\theta$ .

A)  $\frac{42}{841}$

B)  $\frac{41}{841}$

C)  $\frac{840}{841}$

D)  $-\frac{41}{841}$

Complete the equation so the result is an identity.

79) \_\_\_\_\_ +  $\sin^2 x = 1$

79) \_\_\_\_\_

A)  $\cos^2 x$

B)  $\csc^2 x$

C)  $\sin^2 x$

D)  $\tan^2 x$

Find an equivalent algebraic expression for the composition.

80)  $\sec (\arccos (x))$

80) \_\_\_\_\_

A)  $x$

B)  $\sqrt{x}$

C)  $\frac{1}{x^2}$

D)  $\frac{1}{x}$

Use a calculator to find the approximate value of the composition. Round your answer to four decimal places. The expression may be undefined.

81)  $\cos (\cos^{-1} (-0.9372))$

81) \_\_\_\_\_

A) 0.4686

B) -0.4686

C) 0.9372

D) -0.9372

Find the exact value of the composition.

82)  $\sin (\arctan (2))$

82) \_\_\_\_\_

A)  $\frac{2\sqrt{5}}{5}$

B)  $2\sqrt{5}$

C)  $5\sqrt{2}$

D)  $\frac{5\sqrt{2}}{2}$

Solve.

83) Two forces of 650 N and 250 N (newtons) act on an object. The angle between the forces is  $45^\circ$ . Find the magnitude of the resultant and the angle that it makes with the smaller force.

83) \_\_\_\_\_

A) 844 N,  $17^\circ$

B) 845 N,  $33^\circ$

C) 846 N,  $12^\circ$

D) 7 N,  $12^\circ$

**Solve the problem.**

84) To find the distance between two small towns, an electronic distance measuring (EDM) instrument is placed on a hill from which both towns are visible. If the distance from the EDM to the towns is 4 miles and 2.5 miles and the angle between the two lines of sight is  $69^\circ$ , what is the distance between the towns? Round your answer to the nearest tenth of a mile. 84) \_\_\_\_\_

- A) 5.4 mi                      B) 5.1 mi                      C) 3.9 mi                      D) 4.3 mi

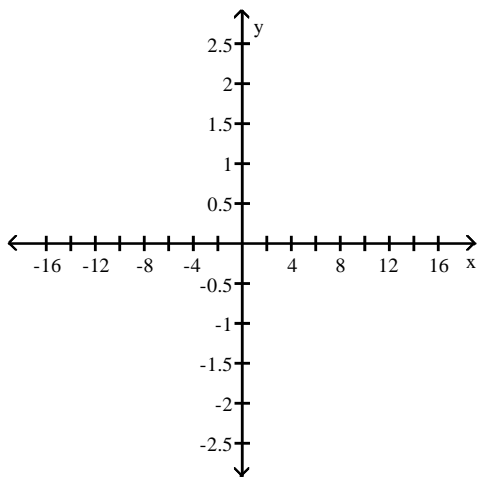
**Perform the indicated operation. Write the answer in the form  $a + bi$ .**

85)  $4(\cos 225^\circ + i \sin 225^\circ) \cdot 6(\cos 225^\circ + i \sin 225^\circ)$  85) \_\_\_\_\_

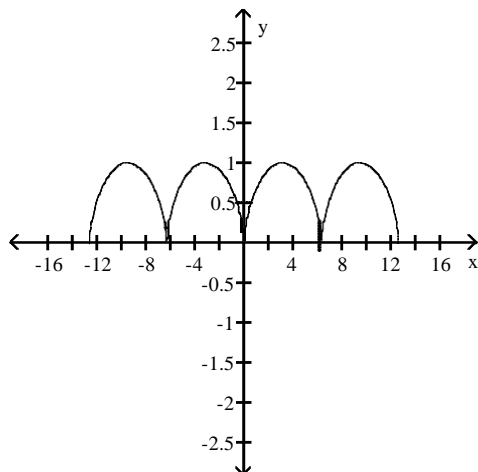
- A)  $24i$                       B) 24                      C)  $-24i$                       D) -24

**Graph the pair of parametric equations with the aid of a graphing calculator.**

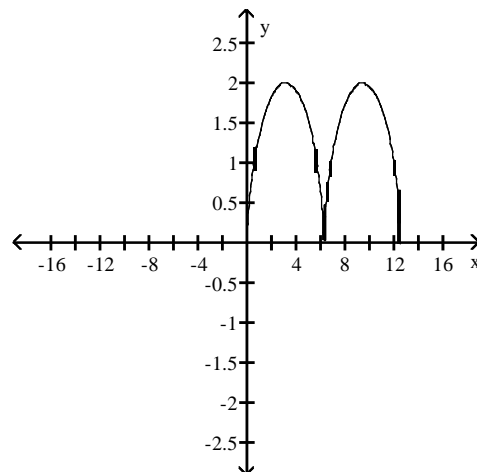
86)  $x = t - \sin t, y = 1 - \cos t, -4\pi \leq t \leq 4\pi$  86) \_\_\_\_\_



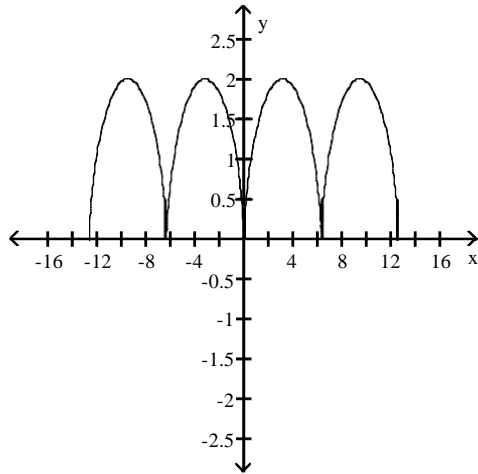
A)



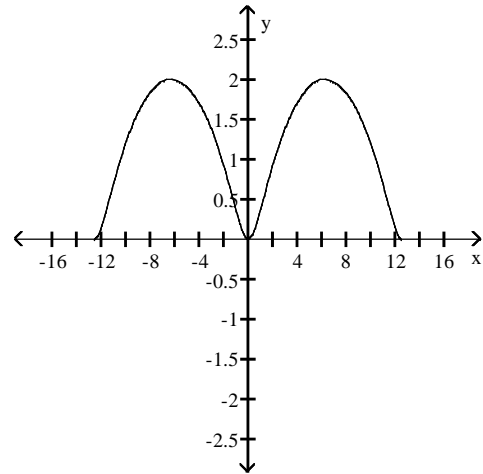
B)



C)



D)



For the given pair of variables determine whether a is a function of b, b is a function of a, both, or neither.

87) a is the radius of any spherical bowling ball, and b is its volume.

87) \_\_\_\_\_

A) b is a function of a

B) a is a function of b

C) Both

D) Neither

Find the inverse using composition.

88)  $f(x) = 7x + 8$ 

88) \_\_\_\_\_

A)  $f^{-1}(x) = \frac{x+8}{7}$ B)  $f^{-1}(x) = \frac{x-8}{7}$ C)  $f^{-1}(x) = \frac{x}{7} - 8$ 

D) Not invertible

Find the measures of two angles, one positive and one negative, that are coterminal with the given angle.

89)  $\frac{8\pi}{3}$ 

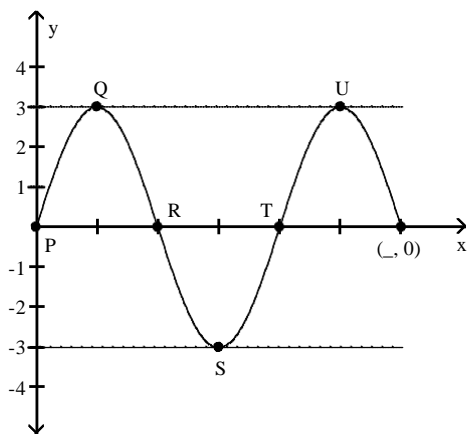
89) \_\_\_\_\_

A)  $\frac{14\pi}{3}, -\frac{2\pi}{3}$ B)  $\frac{11\pi}{3}, -\frac{2\pi}{3}$ C)  $\frac{2\pi}{3}, -\frac{14\pi}{3}$ D)  $\frac{11\pi}{3}, -\frac{11\pi}{3}$

Determine the coordinates of the specified point.

90) Point R

90) \_\_\_\_\_



A)  $\left(\frac{\pi}{2}, 2\right)$

B)  $\left(\frac{\pi}{3}, 2\right)$

C)  $\left(\frac{\pi}{3}, 0\right)$

D)  $\left(\frac{\pi}{2}, 0\right)$

Determine if the equation is an identity.

91)  $\frac{\sin(x+y) + \sin(x-y)}{\cos(x+y) + \cos(x-y)} = \tan x$

91) \_\_\_\_\_

A) Identity

B) Not an identity

Find all real numbers that satisfy the equation.

92)  $\cos x = 1$

92) \_\_\_\_\_

A)  $\left\{x \mid x = \frac{\pi}{2} + 2k\pi\right\}$

B)  $\{x \mid x = \pi + 2k\pi\}$

C)  $\left\{x \mid x = \frac{3\pi}{2} + 2k\pi\right\}$

D)  $\{x \mid x = 0 + 2k\pi\}$

Determine the number of triangles with the given parts.

93)  $a = 32, b = 65, \alpha = 72^\circ$

93) \_\_\_\_\_

A) 3

B) 2

C) 0

D) 1

Use De Moivre's theorem to simplify the expression. Write the answer in a + bi form.

94)  $(3(\cos 300^\circ + i \sin 300^\circ))^4$

94) \_\_\_\_\_

A)  $70.15 - 40.5i$

B)  $-40.5 + 70.15i$

C)  $-1.5 + 2.60i$

D)  $2.60 - 1.5i$

Find the center and radius of the circle.

95)  $(x - 7)^2 + (y - 2)^2 = 1$

95) \_\_\_\_\_

A) Center:  $(-7, -2)$ ; radius: 1

B) Center:  $(-2, -7)$ ; radius: 1

C) Center:  $(2, 7)$ ; radius: 1

D) Center:  $(7, 2)$ ; radius: 1

**Solve the problem.**

96) The minute hand of a clock is 9 inches long. What distance does its tip move in 19 minutes? 96) \_\_\_\_\_

A)  $\frac{19}{540}\pi$  in.

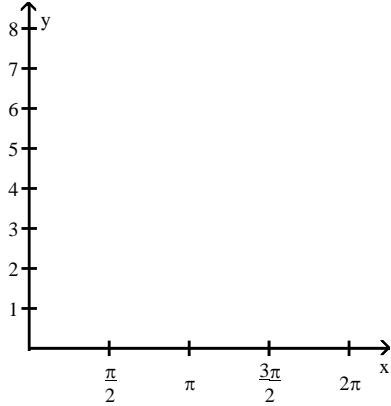
B)  $\frac{57}{20}\pi$  in.

C)  $\frac{19}{270}\pi$  in.

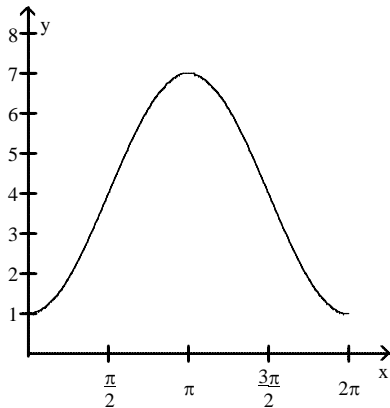
D)  $\frac{57}{10}\pi$  in.

**Graph the function over a one-period interval.**

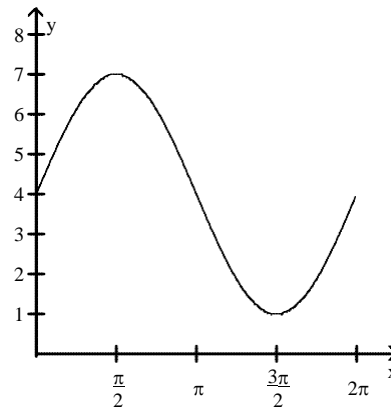
97)  $y = 3 \sin(x - \pi) + 4$  97) \_\_\_\_\_



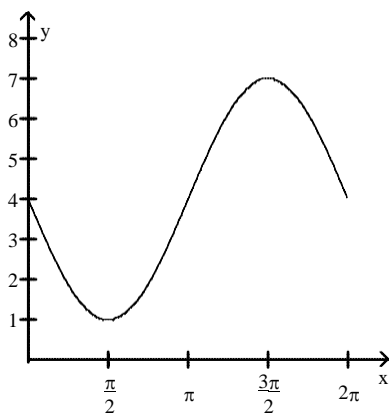
A)



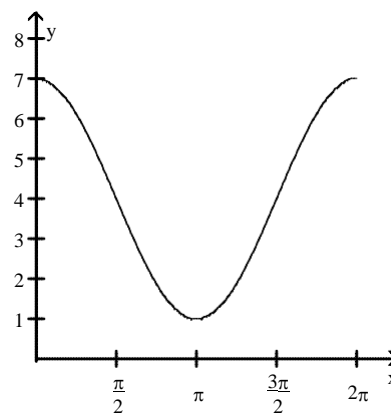
B)



C)



D)



Find the exact value by using a sum or difference identity.

98)  $\sin 15^\circ$

A)  $\frac{-\sqrt{2}(\sqrt{3}+1)}{4}$

B)  $\frac{-\sqrt{2}(\sqrt{3}-1)}{4}$

C)  $\frac{\sqrt{2}(\sqrt{3}+1)}{4}$

D)  $\frac{\sqrt{2}(\sqrt{3}-1)}{4}$

98) \_\_\_\_\_

Find all real numbers in  $[0, 2\pi]$  that satisfy the equation.

99)  $2 \cos x + 1 = 0$

A)  $\frac{\pi}{2}, \frac{3\pi}{2}$

B)  $\frac{2\pi}{3}, \frac{4\pi}{3}$

C)  $\frac{\pi}{3}, \frac{5\pi}{3}$

D)  $\frac{3\pi}{2}$

99) \_\_\_\_\_

Solve the problem.

100) An airplane flies on a compass heading of  $90.0^\circ$  at 280 mph. The wind affecting the plane is blowing from  $335^\circ$  at 32.0 mph. What is the true course and ground speed of the airplane? Round results to an appropriate number of significant digits.

A)  $87^\circ, 294$  mph

B)  $87^\circ, 309$  mph

C)  $95^\circ, 309$  mph

D)  $96^\circ, 295$  mph

100) \_\_\_\_\_

## Answer Key

Testname: TRIGONOMETRY

- |       |        |
|-------|--------|
| 1) C  | 51) D  |
| 2) B  | 52) A  |
| 3) A  | 53) D  |
| 4) D  | 54) B  |
| 5) B  | 55) B  |
| 6) B  | 56) A  |
| 7) C  | 57) A  |
| 8) D  | 58) D  |
| 9) D  | 59) A  |
| 10) B | 60) D  |
| 11) A | 61) D  |
| 12) C | 62) C  |
| 13) C | 63) D  |
| 14) D | 64) A  |
| 15) B | 65) A  |
| 16) B | 66) B  |
| 17) D | 67) D  |
| 18) C | 68) C  |
| 19) D | 69) A  |
| 20) A | 70) B  |
| 21) D | 71) A  |
| 22) B | 72) A  |
| 23) A | 73) B  |
| 24) D | 74) B  |
| 25) B | 75) C  |
| 26) B | 76) D  |
| 27) A | 77) D  |
| 28) D | 78) C  |
| 29) B | 79) A  |
| 30) A | 80) D  |
| 31) B | 81) D  |
| 32) A | 82) A  |
| 33) D | 83) B  |
| 34) C | 84) C  |
| 35) A | 85) A  |
| 36) A | 86) C  |
| 37) A | 87) C  |
| 38) A | 88) B  |
| 39) C | 89) A  |
| 40) B | 90) C  |
| 41) A | 91) A  |
| 42) B | 92) D  |
| 43) B | 93) C  |
| 44) C | 94) B  |
| 45) D | 95) D  |
| 46) C | 96) D  |
| 47) D | 97) C  |
| 48) A | 98) D  |
| 49) B | 99) B  |
| 50) B | 100) D |

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**Practicing Trigonometry**

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