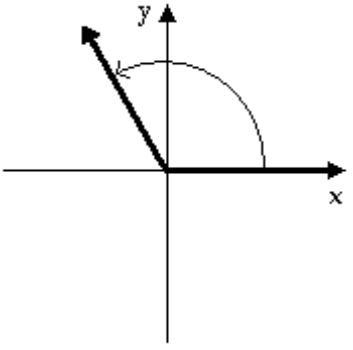
Exam

Name_____

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

Determine the degree measure of the given angle.

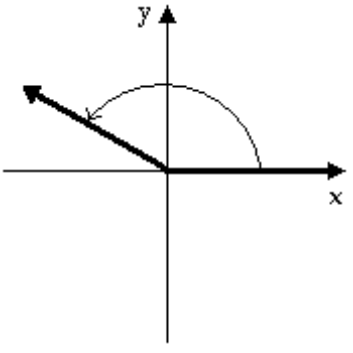
1) 1) _____



A) 60° B) 120° C) 30° D) 150°

Answer: B

Explanation: A)
B)
C)
D)



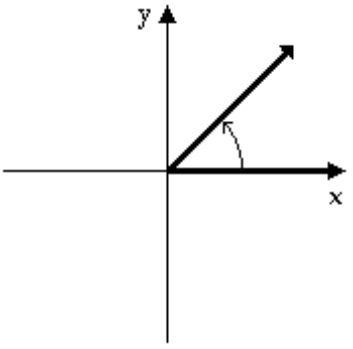
2) 2) _____

A) 60° B) 30° C) 150° D) 120°

Answer: C

Explanation: A)
B)
C)
D)

3) 3) _____

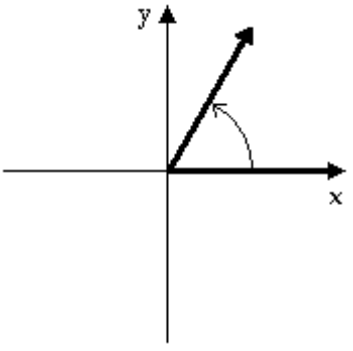


A) 120° B) 45° C) 60° D) 135°

Answer: B

Explanation: A)
B)
C)
D)

4) 4) _____



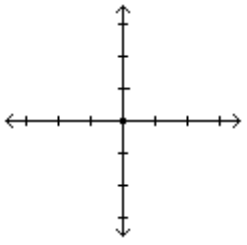
A) 120° B) 30° C) 60° D) 45°

Answer: C

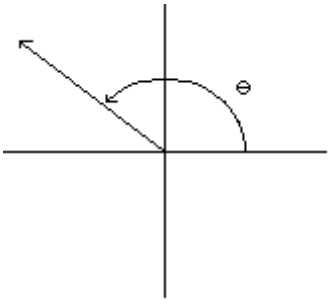
Explanation: A)
B)
C)
D)

Draw the angle having the given radian measure.

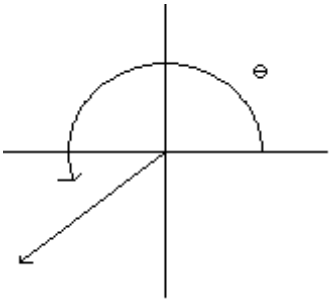
5) $\frac{3\pi}{4}$ 5) _____



A)



B)



Answer: A

Explanation: A)

B)

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

6) sec 240° 6) _____

A) $-\frac{2\sqrt{3}}{3}$ B) 2 C) -2 D) $\frac{2\sqrt{3}}{3}$

Answer: C

Explanation: A)

B)

C)

D)

Find the area of a sector with the given central angle α in a circle of radius r.

7) $\alpha = 90°$, r = 6 cm 7) _____

A) 3π sq cm B) 9π sq cm C) 18π sq cm D) 1.5π sq cm

Answer: B

Explanation: A)

B)

C)

D)

Solve.

8) A weight on a vertical spring is given an initial downward velocity of 2 cm/sec from a point 5 cm above equilibrium. Assuming that the constant ω has a value of 2, find the location of the weight 2 sec after it is set in motion. 8) _____

A) 3.1 cm below the equilibrium position
B) 2.5 cm below the equilibrium position
C) 1.8 cm below the equilibrium position
D) 2.5 cm above the equilibrium position

Answer: B

Explanation: A)
B)
C)
D)

Perform the indicated operation.

9) $\pi - \frac{\pi}{6}$ 9) _____

A) $-\frac{5\pi}{6}$ B) $\frac{5\pi}{6}$ C) $\frac{\pi}{6}$ D) $-\frac{\pi}{6}$

Answer: B

Explanation: A)
B)
C)
D)

Evaluate each expression without using a calculator. Give the result in degrees.

10) $\sin^{-1}(-0.5)$ 10) _____

A) 420° B) 30° C) 60° D) -30°

Answer: D

Explanation: A)
B)
C)
D)

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

11) -40° 11) _____

A) 40° B) 500° C) 320° D) 140°

Answer: C

Explanation: A)
B)
C)
D)

Solve the right triangle with the given sides and angles.

12) $a = 3.7$, $\alpha = 49.1°$ 12) _____

A) $b = 2.1$, $\beta = 40.9°$, $c = 4.3$ B) $b = 5.8$, $\beta = 40.9°$, $c = 4.9$

C) $b = 3.2$, $\beta = 40.9°$, $c = 4.9$ D) $b = 5.8$, $\beta = 40.9°$, $c = 6.9$

Answer: C

Explanation: A)

B)

C)

D)

Evaluate each expression without using a calculator. Give the result in degrees.

13) $\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right)$ 13) _____

A) 210° B) 30° C) -150° D) -30°

Answer: D

Explanation: A)

B)

C)

D)

Convert the angle to radians. Leave as a multiple of π.

14) 36° 14) _____

A) $\frac{\pi}{7}$ B) $\frac{\pi}{5}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{6}$

Answer: B

Explanation: A)

B)

C)

D)

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

15) $\cot \alpha$, if $\sin \alpha = -\frac{3}{5}$ and $\cos \alpha < 0$ 15) _____

A) $\frac{4}{3}$ B) $-\frac{3}{4}$ C) $\frac{3}{4}$ D) $-\frac{4}{3}$

Answer: A

Explanation: A)

B)

C)

D)

Find the quadrant that contains the terminal side of angle α.

16) $\sec \alpha < 0$ and $\csc \alpha < 0$ 16) _____

A) I B) II C) III D) IV

Answer: C

Explanation: A)
B)
C)
D)

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

17) $162°$ 17) _____

A) $342°, -18°$ B) $522°, -18°$ C) $522°, -198°$ D) $432°, -108°$

Answer: C

Explanation: A)
B)
C)
D)

18) $\frac{2\pi}{7}$ 18) _____

A) $\frac{9\pi}{7}, -\frac{12\pi}{7}$ B) $\frac{9\pi}{7}, -\frac{9\pi}{7}$ C) $\frac{12\pi}{7}, -\frac{16\pi}{7}$ D) $\frac{16\pi}{7}, -\frac{12\pi}{7}$

Answer: D

Explanation: A)
B)
C)
D)

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

19) $\tan\left(\frac{\pi}{6}\right)$ 19) _____

A) 1 B) $\sqrt{3}$ C) $\frac{\sqrt{3}}{3}$ D) $\frac{\sqrt{3}}{2}$

Answer: C

Explanation: A)
B)
C)
D)

Convert the degree measure to radian measure. Use the value of π found on a calculator and round answers to three decimal places.

20) 95°48'25" 20) _____

A) 3.344 B) 95.807 C) 1.666 D) 1.672

Answer: D

Explanation: A)
B)
C)
D)

Solve.

21) The ferris wheel at an amusement park is 49 ft in diameter, turns at a rate of 8 rpm, and is 5 ft off the ground at the low point. What is the height of a passenger 20 seconds into the ride? 21) _____

A) 37 ft B) 47 ft C) 13 ft D) 42 ft

Answer: D

Explanation: A)
B)
C)
D)

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

22) csc(π/2) 22) _____

A) -1 B) 1 C) 0 D) Undefined

Answer: B

Explanation: A)
B)
C)
D)

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

23) 481° 23) _____

A) 121° B) 111° C) 301° D) 240.5°

Answer: A

Explanation: A)
B)
C)
D)

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

24) $(-2, -6)$; $\sin \alpha$ 24) _____

A) $-\frac{\sqrt{40}}{6}$ B) $\frac{2}{\sqrt{40}}$ C) $-\frac{6}{\sqrt{40}}$ D) 3

Answer: C

Explanation: A)
B)
C)
D)

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

25) $\cos\left(\frac{\pi}{4}\right)$ 25) _____

A) $\frac{\sqrt{2}}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $\sqrt{2}$ D) $\frac{1}{2}$

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

26) Find $\sin(\alpha)$, given that $\cos(\alpha) = \frac{2}{5}$ and $\sin(\alpha) > 0$. 26) _____

A) $-\frac{3}{5}$ B) $\frac{\sqrt{21}}{5}$ C) $-\frac{\sqrt{21}}{5}$ D) $\frac{3}{5}$

Answer: B

Explanation: A)
B)
C)
D)

Find the measure in radians of the smallest possible angle that is coterminal with the given angle. For angles given in terms of π, express the answer in terms of π. Otherwise, round to the nearest hundredth.

27) $-\frac{3\pi}{10}$ 27) _____

A) $\frac{17\pi}{10}$ B) $\frac{27\pi}{10}$ C) $\frac{3\pi}{10}$ D) $\frac{37\pi}{10}$

Answer: A

Explanation: A)
B)
C)
D)

Determine if the equation is true or false.

28) $\cos\left(\frac{\pi}{6}\right) = \cos\left(\frac{7\pi}{6}\right)$ 28) _____

A) True B) False

Answer: A

Explanation: A)
B)

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

29) cot 300° 29) _____

A) $-\sqrt{3}$ B) $\frac{\sqrt{3}}{3}$ C) $-\frac{\sqrt{3}}{3}$ D) -1

Answer: C

Explanation: A)
B)
C)
D)

Solve the problem.

30) A satellite in a circular orbit 811.7 mi above the earth makes one complete orbit every 86.43 min. What is its linear velocity? Use 3963 mi for the length of the radius of the earth. 30) _____

A) 412,700 mi/min B) 347.1 mi/min
C) 59.01 mi/min D) 55.24 mi/min

Answer: B

Explanation: A)
B)
C)
D)

31) A pulley with a diameter of 19 inches is driven by a belt which is moving 1089 ft/min. To the nearest unit, how many revolutions per minute are made by the pulley? 31) _____

A) 317 rpm B) 231 rpm C) 324 rpm D) 219 rpm

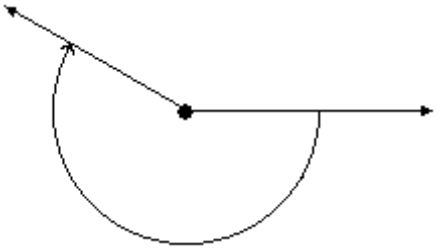
Answer: D

Explanation: A)
B)
C)
D)

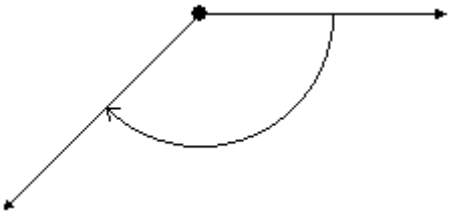
Draw the angle in standard position.

32) $-\frac{3\pi}{4}$ 32) _____

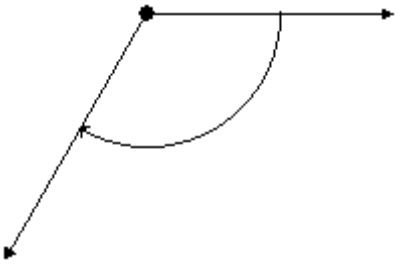
A)



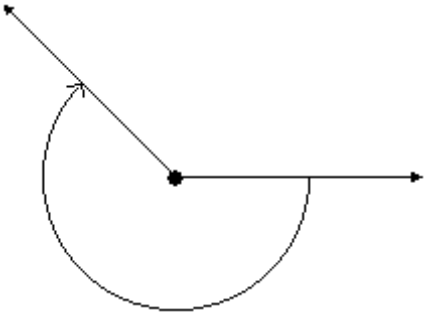
B)



C)



D)



Answer: B

Explanation: A)
B)
C)
D)

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

33) $\sin\frac{4\pi}{3}$ 33) _____

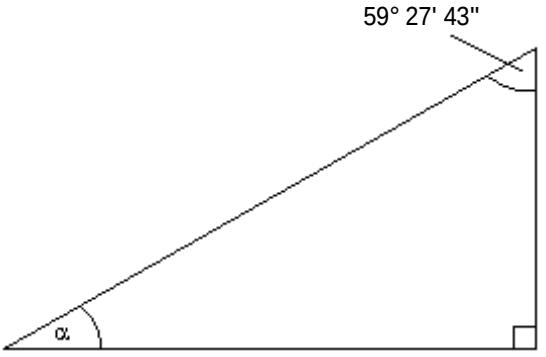
A) $-\frac{1}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $-\frac{\sqrt{3}}{2}$ D) -1

Answer: C

Explanation: A)
B)
C)
D)

Find the degree measure of the angle α in the figure.

34) 34) _____



A) 20° 33' 17" B) 31° 32' 17" C) 30° 32' 17" D) 31° 33' 17"

Answer: C

Explanation: A)
B)
C)
D)

For the given angle, name the quadrant in which the terminal side lies.

35) 1300° 35) _____

A) I B) II C) III D) IV

Answer: C

Explanation: A)
B)
C)
D)

36) -11.7 36) _____

A) II B) I C) IV D) III

Answer: B

Explanation: A)
B)
C)
D)

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

37) 27° 37) _____

A) 207°, -153° B) 117°, -63° C) 387°, -153° D) 387°, -333°

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

38) Find the acute angle α (in degrees) that satisfies the equation $\alpha = \tan^{-1}(1)$. 38) _____

A) 45° B) 90° C) 180° D) 0°

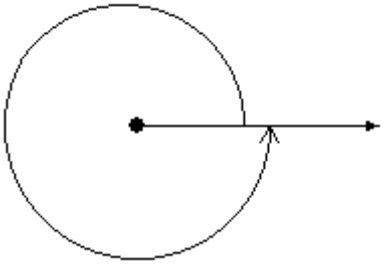
Answer: A

Explanation: A)
B)
C)
D)

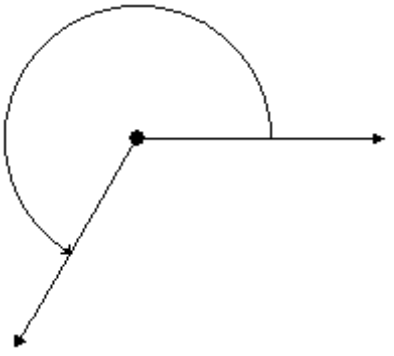
Draw the angle in standard position.

39) $\frac{17\pi}{3}$ 39) _____

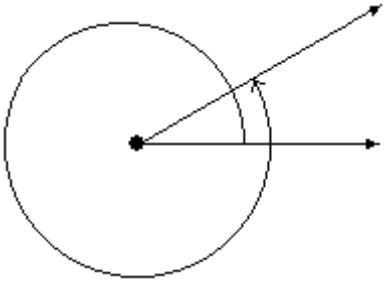
A)



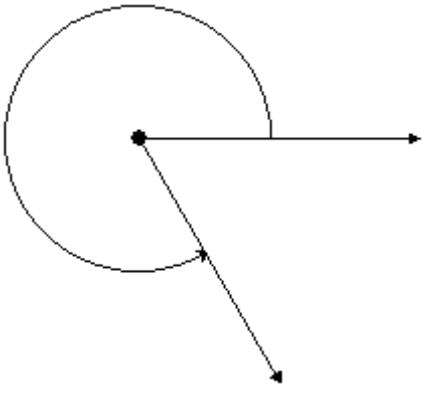
B)



C)



D)



Answer: D

Explanation: A)
B)
C)
D)

Solve the right triangle with the given sides and angles.

40) $a = 1.4, \beta = 42.9°$ 40) _____

A) $\alpha = 47.1°$, b = 2.3, c = 2.7 B) $\alpha = 47.1°$, b = 2.3, c = 1.9

C) $\alpha = 47.1°$, b = 1.3, c = 1.9 D) $\alpha = 47.1°$, b = 0.2, c = 1.4

Answer: C

Explanation: A)

B)

C)

D)

For the given angle, name the quadrant in which the terminal side lies.

41) -330° 41) _____

A) I B) II C) III D) IV

Answer: A

Explanation: A)

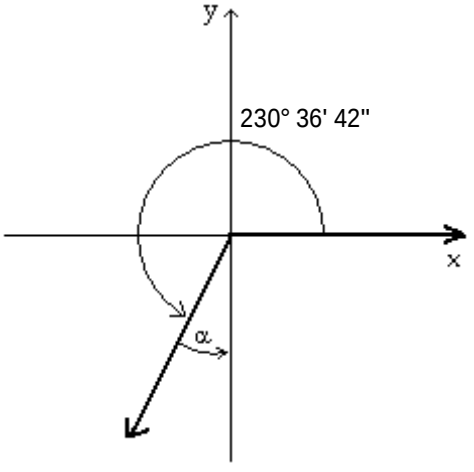
B)

C)

D)

Find the degree measure of the angle α in the figure.

42) 42) _____



A) 39° 23' 18" B) 50° 23' 18" C) 50° 24' 18" D) 40° 24' 18"

Answer: A

Explanation: A)

B)

C)

D)

Convert the degree measure to radian measure. Use the value of π found on a calculator and round answers to three decimal places.

43) 130.6° 43) _____

A) 4.559 B) 410.292 C) 0.439 D) 2.279

Answer: D

Explanation: A)
B)
C)
D)

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

44) $4 \cos \theta$, if $\theta = 45°$ 44) _____

A) $4\sqrt{2}$ B) $-2\sqrt{2}$ C) $-4\sqrt{2}$ D) $2\sqrt{2}$

Answer: D

Explanation: A)
B)
C)
D)

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

45) 96°27' - 48°35' 45) _____

A) 144°62' B) 48°35' C) 48°8' D) 47°52'

Answer: D

Explanation: A)
B)
C)
D)

Use a calculator to find the acute angle α (to the nearest tenth of a degree) that satisfies the equation.

46) $\alpha = \tan^{-1}(1.5753313)$ 46) _____

A) 122.4° B) 237.6° C) 32.4° D) 57.6°

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

47) The air speed of an airplane is 580 km/hr and its angle of climb is 1.15°. What is its ground speed (to the nearest km/hr)? 47) _____

A) 580 km/hr B) 570 km/hr C) 565 km/hr D) 575 km/hr

Answer: A

Explanation: A)
B)
C)
D)

Find the reference angle for the given angle.

48) 79° 48) _____

A) 169° B) 11° C) 101° D) 79°

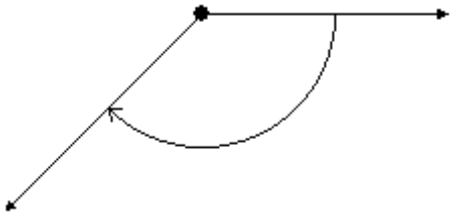
Answer: D

Explanation: A)
B)
C)
D)

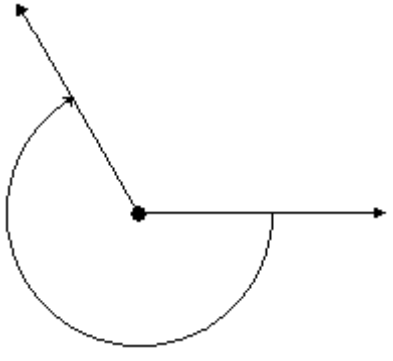
Draw the angle in standard position.

49) $-\frac{7\pi}{6}$ 49) _____

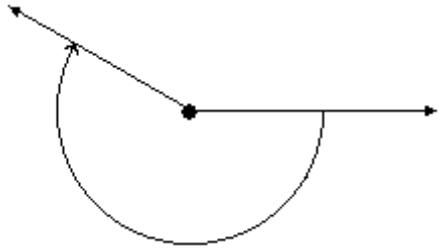
A)



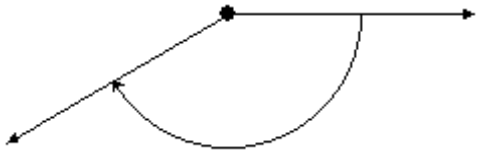
B)



C)



D)



Answer: C

Explanation: A)
B)
C)
D)

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

50) $\sin\left(\frac{5\pi}{6}\right)$ 50) _____

A) $\frac{1}{2}$ B) $-\frac{\sqrt{3}}{2}$ C) $-\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

51) A pulley of radius 5 cm rotates 5 times in 64 sec. Find the angular velocity of the pulley. 51) _____

A) $\frac{64\pi}{5}$ radians/sec B) $\frac{5\pi}{32}$ radians/sec

C) $\frac{25\pi}{64}$ radians/sec D) $\frac{32\pi}{25}$ radians/sec

Answer: B

Explanation: A)
B)
C)
D)

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

52) sin (388°) 52) _____

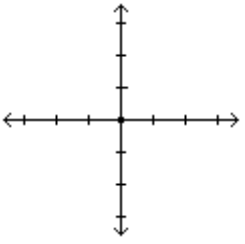
A) 0.4695 B) 0.8829 C) -0.0349 D) 0.8480

Answer: A

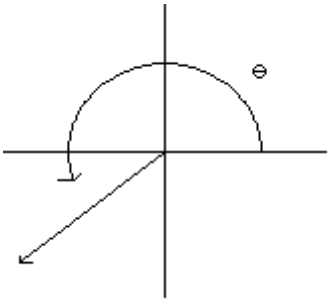
Explanation: A)
B)
C)
D)

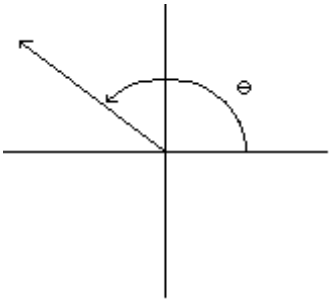
Draw the angle having the given radian measure.

53) 135° 53) _____



A) B)





Answer: B

Explanation: A)
B)

Convert the angle to degrees, minutes, and seconds.

54) -10.83° 54) _____

A) -10°49'48" B) -10°59'48" C) -10°59'38" D) -10°49'38"

Answer: A

Explanation: A)
B)
C)
D)

Find the product. Be sure to indicate the units for the answer. Round approximate answers to the nearest tenth.

55) $\frac{1845 \text{ rev}}{17 \text{ min}} \cdot \frac{15 \text{ in}}{1 \text{ rev}} \cdot \frac{1 \text{ ft}}{12 \text{ in}}$ 55) _____

A) 2306.3 ft/min B) 135.7 ft/min C) 1627.9 rev/min D) 814.0 in/min

Answer: B

Explanation: A)
B)
C)
D)

Convert the angle to radians. Leave as a multiple of π.

56) 510° 56) _____

A) $\frac{17\pi}{6}$ B) $\frac{17\pi}{12}$ C) $\frac{17\pi}{3}$ D) $\frac{17\pi}{5}$

Answer: A

Explanation: A)
B)
C)
D)

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

57) cos (673°) 57) _____

A) 0.6820 B) 0.2249 C) 0.9563 D) -0.7314

Answer: A

Explanation: A)
B)
C)
D)

Find the length of the arc intercepted by the given central angle α in a circle of radius r.

58) $\alpha = \frac{17\pi}{5}$, r = 0.912 mm 58) _____

A) 0.843 mm B) 0.268 mm C) 3.101 mm D) 9.741 mm

Answer: D

Explanation: A)
B)
C)
D)

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

59) $33°48'16"$ 59) _____

A) $33.81°$ B) $33.86°$ C) $33.76°$ D) $33.80°$

Answer: D

Explanation: A)
B)
C)
D)

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

60) $\tan\left(\frac{5\pi}{3}\right)$ 60) _____

A) $\sqrt{3}$ B) $\frac{\sqrt{3}}{2}$ C) $-\frac{\sqrt{3}}{3}$ D) $-\sqrt{3}$

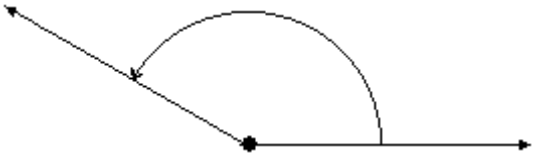
Answer: D

Explanation: A)
B)
C)
D)

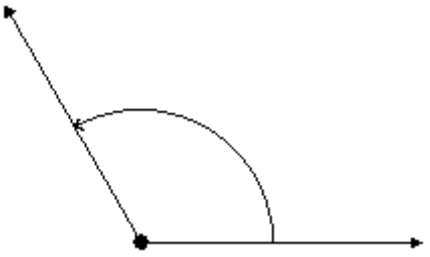
Draw the angle in standard position.

61) $\frac{2\pi}{3}$ 61) _____

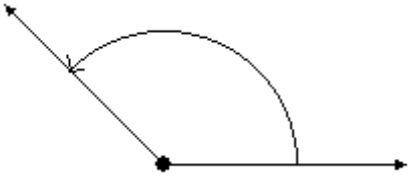
A)



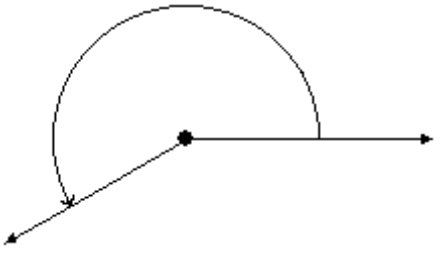
B)



C)



D)



Answer: B

Explanation: A)
B)
C)
D)

Find the quadrant that contains the terminal side of angle α.

62) $\sec\alpha < 0$ and $\tan\alpha < 0$ 62) _____

A) I B) II C) III D) IV

Answer: B

Explanation: A)
B)
C)
D)

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

63) cot 30° 63) _____

A) $\sqrt{3}$ B) 1 C) $\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{3}}{3}$

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

64) Two pulleys of diameter 6 m and 3 m are connected by a belt. The larger pulley rotates 46 times per min. Find the angular velocity of the smaller pulley. 64) _____

A) 276π radians/min B) 92π radians/min

C) 138π radians/min D) 184π radians/min

Answer: D

Explanation: A)
B)
C)
D)

65) Find sin (α), given that cos (α) = $\frac{2}{9}$ and α is in quadrant IV. 65) _____

A) $-\frac{9}{2}$ B) $-\sqrt{77}$ C) $-\frac{\sqrt{77}}{9}$ D) $-\frac{\sqrt{77}}{2}$

Answer: C

Explanation: A)
B)
C)
D)

Perform the indicated operation.

66) $\frac{\pi}{11} + 2\pi$ 66) _____

A) $\frac{\pi}{11}$ B) $\frac{5\pi}{11}$ C) $-\frac{\pi}{11}$ D) $\frac{7\pi}{11}$

Answer: A

Explanation: A)
B)
C)
D)

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

67) $(15, 20)$; $\cos \alpha$ 67) _____

A) $\frac{3}{4}$ B) $\frac{3}{5}$ C) $\frac{4}{3}$ D) $\frac{4}{5}$

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

68) A wheel with a 22-inch diameter is turning at the rate of 34 revolutions per minute. To the nearest inch per minute, what is the linear velocity of a point on the rim? 68) _____

A) 2350 in./min B) 2396 in./min C) 2357 in./min D) 2403 in./min

Answer: A

Explanation: A)
B)
C)
D)

Find the exact value of the expression.

69) $\sin\left(\frac{\pi}{2} - \frac{\pi}{6}\right)$ 69) _____

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{1}{2}$

Answer: C

Explanation: A)
B)
C)
D)

Find the reference angle for the given angle.

70) $-361°$ 70) _____

A) $89°$ B) $1°$ C) $91°$ D) $179°$

Answer: B

Explanation: A)
B)
C)
D)

Convert the angle to radians. Leave as a multiple of π.

71) 360° 71) _____

A) 2π B) $\frac{5\pi}{2}$ C) 4π D) $\frac{3\pi}{2}$

Answer: A

Explanation: A)
B)
C)
D)

Find the reference angle for the given angle.

72) 430° 72) _____

A) 160° B) 110° C) 70° D) 20°

Answer: C

Explanation: A)
B)
C)
D)

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

73) 180° - 129°35'25" 73) _____

A) 50°24'35" B) 51°25'35" C) 51°24'35" D) 50°25'35"

Answer: A

Explanation: A)
B)
C)
D)

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

74) (-4, -3) Find sec α. 74) _____

A) $\frac{3}{4}$ B) $-\frac{5}{4}$ C) $-\frac{4}{5}$ D) $\frac{5}{3}$

Answer: B

Explanation: A)
B)
C)
D)

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

75) $\sec \frac{3\pi}{4}$ 75) _____

A) $\frac{\sqrt{2}}{2}$ B) -2 C) $-\sqrt{2}$ D) $-\frac{2\sqrt{3}}{3}$

Answer: C

Explanation: A)
B)
C)
D)

76) $\tan \frac{7\pi}{6}$ 76) _____

A) $-\sqrt{3}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{\sqrt{3}}{3}$ D) $\sqrt{3}$

Answer: C

Explanation: A)
B)
C)
D)

77) $\tan 570°$ 77) _____

A) $\sqrt{3}$ B) $\frac{\sqrt{3}}{3}$ C) $\frac{\sqrt{3}}{2}$ D) $-\sqrt{3}$

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

78) When sitting atop a tree and looking down at his pal Joey, the angle of depression of Mack's line of sight is 53°51'. If Joey is known to be standing 25 feet from the base of the tree, how tall is the tree (to the nearest foot)? 78) _____

A) 38 ft B) 40 ft C) 36 ft D) 34 ft

Answer: D

Explanation: A)
B)
C)
D)

Evaluate each expression without using a calculator. Give the result in degrees.

79) $\cos^{-1}\left(\frac{\sqrt{2}}{2}\right)$ 79) _____

A) 330° B) 315° C) 30° D) 45°

Answer: D

Explanation: A)
B)
C)
D)

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

80) $\cot\left(\frac{\pi}{4}\right)$ 80) _____

A) $\sqrt{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{2\sqrt{3}}{3}$ D) 1

Answer: D

Explanation: A)
B)
C)
D)

Solve.

81) An engine is "turning over" at an angular velocity of 2400 rpm. Express this angular velocity in rad/min. 81) _____

A) 4800 π rad/min B) $\frac{4800}{\pi}$ rad/min

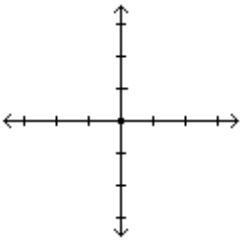
C) 2400 π rad/min D) $\frac{2400}{\pi}$ rad/min

Answer: A

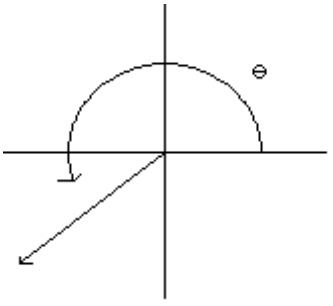
Explanation: A)
B)
C)
D)

Draw the angle having the given radian measure.

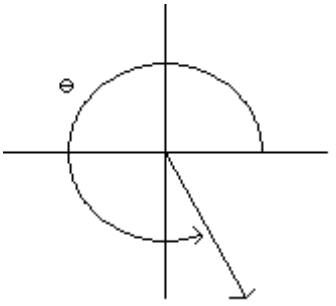
82) 225° 82) _____



A)



B)



Answer: A

Explanation: A)

B)

Convert the angle to degrees, minutes, and seconds.

83) -181.34° 83) _____

A) -181°16'34" B) -181°20'28" C) -181°20'16" D) -181°20'24"

Answer: D

Explanation: A)

B)

C)

D)

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

84) (6, 8); sin α 84) _____

A) $\frac{3}{5}$ B) $\frac{4}{5}$ C) $\frac{4}{3}$ D) $\frac{3}{4}$

Answer: B

Explanation: A)

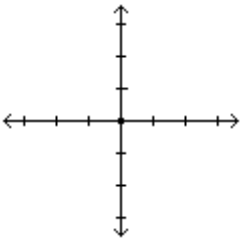
B)

C)

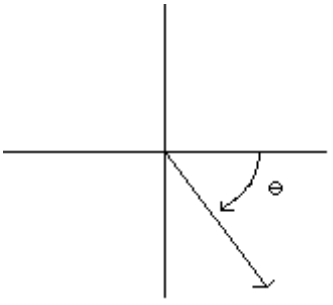
D)

Draw the angle having the given radian measure.

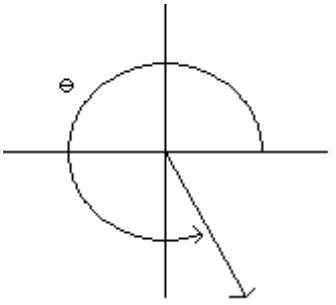
85) $\frac{5\pi}{3}$ 85) _____



A)



B)



Answer: B

Explanation: A)

B)

Convert the angle to degrees, minutes, and seconds.

86) 238.17° 86) _____

A) 238°10'17" B) 238°10'16" C) 238°15'17" D) 238°11'15"

Answer: B

Explanation: A)

B)

C)

D)

87) 29.47° 87) _____

A) 29°28'18" B) 29°28'47" C) 29°28'12" D) 29°28'0"

Answer: C

Explanation: A)

B)

C)

D)

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

88) sin (9°10') 88) _____

A) 0.1614 B) 0.9872 C) 0.4121 D) 0.1593

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

89) The angle between the spokes of a wagon wheel is 19 °38' 37". Convert this angle to decimal degree format (to four decimal places). 89) _____

A) 18.3564° B) 20.2500° C) 19.2478° D) 19.6436°

Answer: D

Explanation: A)
B)
C)
D)

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

90) cot 60° 90) _____

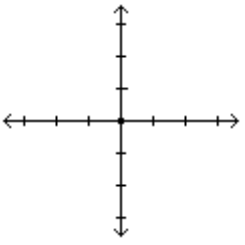
A) $\frac{\sqrt{3}}{3}$ B) $\frac{1}{2}$ C) $\sqrt{3}$ D) 1

Answer: A

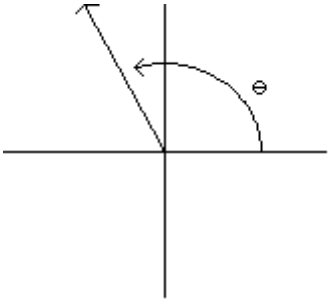
Explanation: A)
B)
C)
D)

Draw the angle having the given radian measure.

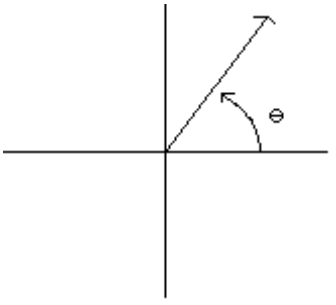
91) $\frac{\pi}{3}$ 91) _____



A)



B)



Answer: B

Explanation: A)

B)

Find the quadrant that contains the terminal side of angle α.

92) $\cot \alpha < 0$ and $\csc \alpha > 0$ 92) _____

A) I B) II C) III D) IV

Answer: B

Explanation: A)

B)

C)

D)

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

93) $\sec(-\pi/2)$ 93) _____

A) -1 B) 1 C) 0 D) Undefined

Answer: D

Explanation: A)

B)

C)

D)

Solve the problem.

94) From a boat on the lake, the angle of elevation to the top of a cliff is 21°10'. If the base of the cliff is 1268 feet from the boat, how high is the cliff (to the nearest foot)? 94) _____

A) 491 ft B) 501 ft C) 494 ft D) 504 ft

Answer: A

Explanation: A)
B)
C)
D)

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

95) $\sin\left(\frac{7\pi}{6}\right)$ 95) _____

A) $\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) $-\frac{\sqrt{3}}{2}$

Answer: B

Explanation: A)
B)
C)
D)

Determine if the equation is true or false.

96) sin (86°) = sin (446°) 96) _____

A) True B) False

Answer: A

Explanation: A)
B)

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

97) csc 1020° 97) _____

A) $-\sqrt{3}$ B) $-\frac{2\sqrt{3}}{3}$ C) $-\sqrt{2}$ D) $-\frac{1}{2}$

Answer: B

Explanation: A)
B)
C)
D)

Evaluate each expression without using a calculator. Give the result in degrees.

98) $\sin^{-1}\left(\frac{1}{2}\right)$ 98) _____

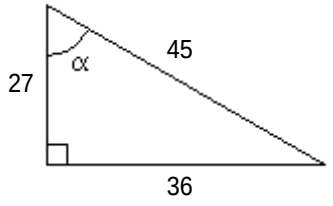
A) 330° B) 30° C) 45° D) 60°

Answer: B

Explanation: A)
B)
C)
D)

Evaluate the function requested. Write your answer as a fraction in lowest terms.

99) Find $\sin \alpha$. 99) _____

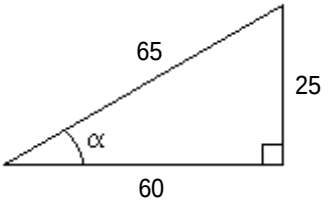


A) $\frac{3}{5}$ B) $\frac{4}{3}$ C) $\frac{4}{5}$ D) $\frac{5}{4}$

Answer: C

Explanation: A)
B)
C)
D)

100) Find $\tan \alpha$. 100) _____



A) $\frac{5}{13}$ B) $\frac{13}{5}$ C) $\frac{5}{12}$ D) $\frac{12}{5}$

Answer: C

Explanation: A)
B)
C)
D)

Solve the problem.

101) The minute hand of a clock is 13 inches long. What distance does its tip move in 20 minutes? 101) ____

A) $\frac{1}{39}\pi$ in. B) $\frac{2}{39}\pi$ in. C) $\frac{13}{3}\pi$ in. D) $\frac{26}{3}\pi$ in.

Answer: D

Explanation: A)
B)
C)
D)

102) The chairlift at a ski resort has a vertical rise of 2200 feet. If the length of the ride is 1.4 miles, what is the average angle of elevation of the lift (to the nearest tenth of a degree)? 102) ____

A) 14.3° B) 17.3° C) 20.3° D) 11.3°

Answer: B

Explanation: A)
B)
C)
D)

Find the exact value of the expression.

103) cos 5° sin 85° + sin 5° cos 85° 103) ____

A) 2 B) -1 C) 0 D) 1

Answer: D

Explanation: A)
B)
C)
D)

Find the length of the arc intercepted by the given central angle α in a circle of radius r.

104) $\alpha = \frac{2\pi}{3}$, r = 63.7 m 104) ____

A) 42.5 m B) 95.6 m C) 300.2 m D) 133.4 m

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

105) Find the acute angle α (in degrees) that satisfies the equation $\cos \alpha = \left(\frac{\sqrt{3}}{2}\right)$. 105) ____

A) 45° B) 30° C) 330° D) 315°

Answer: B

Explanation: A)
B)
C)
D)

Find the radius of a circle with central angle α intercepting an arc of length s.

106) α = 1.5 radians, s = 9 in. 106) ____

A) 2.1 in. B) 13.5 in. C) 4.3 in. D) 6 in.

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

107) A sensor light installed on the edge of a home can detect motion for a distance of 47 ft. in front and with a range of motion of 206°. Over what area will the sensor detect motion and become illuminated? Round to two decimal places. 107) ____

A) 3971.00 ft^2 B) 7942.19 ft^2 C) 7942.29 ft^2 D) 3971.10 ft^2

Answer: D

Explanation: A)
B)
C)
D)

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

108) tan 300° 108) ____

A) $\frac{\sqrt{3}}{3}$ B) $-\sqrt{3}$ C) $\sqrt{3}$ D) $-\frac{\sqrt{3}}{3}$

Answer: B

Explanation: A)
B)
C)
D)

Evaluate each expression without using a calculator. Give the result in degrees.

109) $\cos^{-1}(0)$ 109) ____

A) $0°$ B) $90°$ C) $180°$ D) $45°$

Answer: B

Explanation: A)
B)
C)
D)

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

110) $\cos\left(\frac{\pi}{3}\right)$ 110) ____

A) $\frac{\sqrt{3}}{2}$ B) $\frac{2\sqrt{3}}{3}$ C) $\frac{\sqrt{2}}{2}$ D) $\frac{1}{2}$

Answer: D

Explanation: A)
B)
C)
D)

For the given angle, name the quadrant in which the terminal side lies.

111) $128°$ 111) ____

A) I B) II C) III D) IV

Answer: B

Explanation: A)
B)
C)
D)

Convert the angle to radians. Leave as a multiple of π.

112) $-45°$ 112) ____

A) $-\frac{\pi}{5}$ B) $-\frac{\pi}{6}$ C) $-\frac{\pi}{4}$ D) $-\frac{\pi}{3}$

Answer: C

Explanation: A)
B)
C)
D)

Solve the problem.

113) On a flywheel with a 62.1-mm radius, how long is an arc subtended by a central angle of 142°? 113) ____

A) 308 mm B) 55,406 mm C) 154 mm D) 4779 mm

Answer: C

Explanation: A)
B)
C)
D)

Convert the angle to degrees, minutes, and seconds.

114) 134.63° 114) ____

A) 134°38'48" B) 134°35'63" C) 134°37'48" D) 134°37'63"

Answer: C

Explanation: A)
B)
C)
D)

For the given angle, name the quadrant in which the terminal side lies.

115) -633° 115) ____

A) I B) II C) III D) IV

Answer: A

Explanation: A)
B)
C)
D)

Find the quadrant that contains the terminal side of angle α.

116) $\sec \alpha > 0$ and $\csc \alpha < 0$ 116) ____

A) I B) II C) III D) IV

Answer: D

Explanation: A)
B)
C)
D)

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

117) -167°33'16" 117) ____

A) -167.59° B) -167.55° C) -167.49° D) -167.54°

Answer: B

Explanation: A)
B)
C)
D)

Evaluate each expression without using a calculator. Give the result in degrees.

118) $\sin^{-1}(-1)$ 118) ____

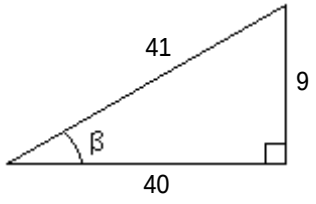
A) 180° B) -90° C) 0° D) 45°

Answer: B

Explanation: A)
B)
C)
D)

Evaluate the function requested. Write your answer as a fraction in lowest terms.

119) Find $\cos \beta$. 119) ____



A) $\frac{41}{40}$ B) $\frac{9}{40}$ C) $\frac{40}{41}$ D) $\frac{9}{41}$

Answer: C

Explanation: A)
B)
C)
D)

Find the length of the arc intercepted by the given central angle α in a circle of radius r.

120) $\alpha = 6.40$, r = 15.77 cm 120) ____

A) 101.328 cm B) 100.928 cm C) 101.728 cm D) 100.528 cm

Answer: B

Explanation: A)
B)
C)
D)

Find the area of a sector with the given central angle α in a circle of radius r.

121) $\alpha = 2$, r = 7 inches 121) ____

A) 98 sq in. B) 7 sq in. C) 49 sq in. D) 14 sq in.

Answer: C

Explanation: A)
B)
C)
D)

For the given angle, name the quadrant in which the terminal side lies.

122) $-678°$ 122) ____

A) I B) II C) III D) IV

Answer: A

Explanation: A)
B)
C)
D)

Perform the indicated operation.

123) $-\frac{\pi}{6} + 2\pi$ 123) ____

A) $-\frac{3\pi}{6}$ B) $-\frac{\pi}{6}$ C) $-\frac{6\pi}{6}$ D) $\frac{\pi}{6}$

Answer: B

Explanation: A)
B)
C)
D)

Find the radius of a circle with central angle α intercepting an arc of length s.

124) α = 2.5 radians, s = 10 in. 124) ____

A) 4 in. B) 4.3 in. C) 8 in. D) 25 in.

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

125) The angle of elevation from the ground to the top of a building is $44.865°$. Write this angle in the degrees-minutes-seconds format, to the nearest tenth of a second. 125) ____

A) 44° 51' B) 44° 51' 54" C) 42° 51' 54" D) 44° 51' 49"

Answer: B

Explanation: A)
B)
C)
D)

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

126) sec α, if $\cos \alpha = \frac{1}{4}$ and $\sin \alpha > 0$ 126) ____

A) $\frac{\sqrt{15}}{15}$ B) $\sqrt{15}$ C) - 4 D) 4

Answer: D

Explanation: A)
B)
C)
D)

Solve the problem.

127) At an altitude of 2400 ft, the engine on a small plane fails. What angle of depression is needed to reach an airport runway that is 5 miles away by land? (Round your answer to the nearest tenth of a degree.) 127) ____

A) 88.9° B) 89.9° C) 5.2° D) 6.2°

Answer: C

Explanation: A)
B)
C)
D)

Convert the angle to radians. Leave as a multiple of π.

128) -450° 128) ____

A) $\frac{5\pi}{2}$ B) -5π C) $-\frac{5\pi}{2}$ D) $-\frac{5\pi}{4}$

Answer: C

Explanation: A)
B)
C)
D)

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

129) 181°59'16" 129) ____

A) 182.00° B) 181.95° C) 182.05° D) 181.99°

Answer: D

Explanation: A)
B)
C)
D)

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

130) $\frac{4\pi}{5}$ 130) ____

A) $\frac{9\pi}{5}, -\frac{6\pi}{5}$ B) $\frac{6\pi}{5}, -\frac{14\pi}{5}$ C) $\frac{9\pi}{5}, -\frac{9\pi}{5}$ D) $\frac{14\pi}{5}, -\frac{6\pi}{5}$

Answer: D

Explanation: A)
B)
C)
D)

Perform the indicated operation.

131) $\pi + \frac{\pi}{8}$ 131) ____

A) $-\frac{\pi}{8}$ B) $-\frac{9\pi}{8}$ C) $\frac{\pi}{8}$ D) $\frac{9\pi}{8}$

Answer: D

Explanation: A)
B)
C)
D)

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

132) 292°51'22" 132) ____

A) 292.82° B) 292.86° C) 292.87° D) 292.92°

Answer: B

Explanation: A)
B)
C)
D)

Convert the angle to radians. Leave as a multiple of π.

133) -610° 133) ____

A) $-\frac{61\pi}{18}$ B) $-\frac{61\pi}{36}$ C) $-\frac{61\pi}{9}$ D) $-\frac{25\pi}{18}$

Answer: A

Explanation: A)
B)
C)
D)

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

134) $\cos\left(\frac{23\pi}{24}\right)$ 134) ____

A) 0.1305 B) -0.9914 C) 0.5749 D) -0.9589

Answer: B

Explanation: A)
B)
C)
D)

135) sin(3.13) 135) ____

A) 0.0546 B) 0.9985 C) 0.9999 D) 0.0116

Answer: D

Explanation: A)
B)
C)
D)

Convert the angle to degrees, minutes, and seconds.

136) -228.33° 136) ____

A) -228°19'42" B) -228°20'41" C) -228°19'33" D) -228°41'33"

Answer: A

Explanation: A)
B)
C)
D)

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

137) -248° 137) ____

A) 112°, -428° B) 22°, -518° C) -788°, -608° D) 112°, -608°

Answer: D

Explanation: A)
B)
C)
D)

Find the quadrant that contains the terminal side of angle α.

138) $\csc \alpha < 0$ and $\cot \alpha > 0$ 138) ____

A) I B) II C) III D) IV

Answer: C

Explanation: A)
B)
C)
D)

Solve.

139) Express the angular velocity of 900 rad/sec in rev/sec (to the nearest hundredth). 139) ____

A) 143.24 rev/s B) 5,654.87 rev/s C) 2,827.43 rev/s D) 286.48 rev/s

Answer: A

Explanation: A)
B)
C)
D)

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

140) $\sin 405°$ 140) ____

A) $\frac{\sqrt{2}}{2}$ B) $-\frac{\sqrt{2}}{2}$ C) $-\frac{1}{2}$ D) $\frac{1}{2}$

Answer: A

Explanation: A)
B)
C)
D)

Use a calculator to find the acute angle α (to the nearest tenth of a degree) that satisfies the equation.

141) $\tan \alpha = 0.91203476$ 141) ____

A) 317.6° B) 47.6° C) 42.4° D) 222.4°

Answer: C

Explanation: A)
B)
C)
D)

Find the exact value of the expression.

142) $\cos 360° - 9 \sin 90°$ 142) ____

A) 1 B) -8 C) 0 D) -9

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

143) Find the acute angle α (in degrees) that satisfies the equation $\sin \alpha = -0.5$. 143) ____

A) 420° B) -30° C) 30° D) 60°

Answer: B

Explanation: A)
B)
C)
D)

144) Find the acute angle α (in degrees) that satisfies the equation $\alpha = \cos^{-1}\left(\frac{\sqrt{2}}{2}\right)$. 144) ____

A) 315° B) 30° C) 45° D) 330°

Answer: C

Explanation: A)
B)
C)
D)

Find the measure in radians of the smallest possible angle that is coterminal with the given angle. For angles given in terms of π, express the answer in terms of π. Otherwise, round to the nearest hundredth.

145) $\frac{12\pi}{5}$ 145) ____

A) $\frac{8\pi}{5}$ B) $-\frac{12\pi}{5}$ C) $\frac{7\pi}{5}$ D) $\frac{2\pi}{5}$

Answer: D

Explanation: A)
B)
C)
D)

Use a calculator to evaluate the expression. Round approximate answers to four decimal places.

146) 3 sin(4)cos(4) 146) ____

A) -2.2704 B) 0.2088 C) -1.9609 D) 1.4840

Answer: D

Explanation: A)
B)
C)
D)

Solve the right triangle with the given sides and angles.

147) a = 3.8, b = 2.9 147) ____

A) $\alpha = 48.2°, \beta = 41.8°, c = 4.8$ B) $\alpha = 49.7°, \beta = 40.3°, c = 6.7$

C) $\alpha = 52.7°, \beta = 37.3°, c = 4.8$ D) $\alpha = 37.3°, \beta = 52.7°, c = 4.8$

Answer: C

Explanation: A)

B)

C)

D)

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

148) (3, -6) Find tan α. 148) ____

A) $-\frac{1}{2}$ B) $-\frac{6}{7}$ C) -2 D) $\frac{3}{7}$

Answer: C

Explanation: A)

B)

C)

D)

Find the product. Be sure to indicate the units for the answer. Round approximate answers to the nearest tenth.

149) $\frac{28 \text{ rad}}{30 \text{ sec}} \cdot \frac{3600 \text{ sec}}{1 \text{ hr}}$ 149) ____

A) 3360 rad/hr B) 336 rad/hr C) 3360 rad/sec D) 120 rad/hr

Answer: A

Explanation: A)

B)

C)

D)

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

150) $\cos\left(\frac{7\pi}{4}\right)$ 150) ____

A) $-\frac{\sqrt{2}}{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{1}{2}$

Answer: B

Explanation: A)

B)

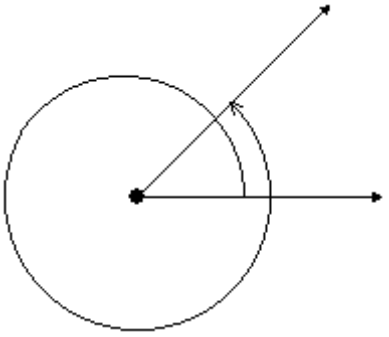
C)

D)

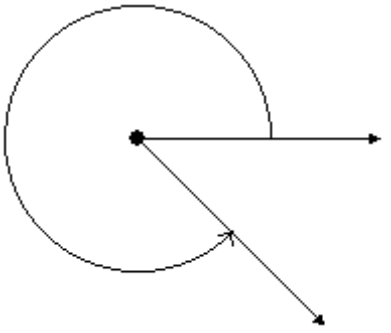
Draw the angle in standard position.

151) $\frac{7\pi}{4}$ 151) ____

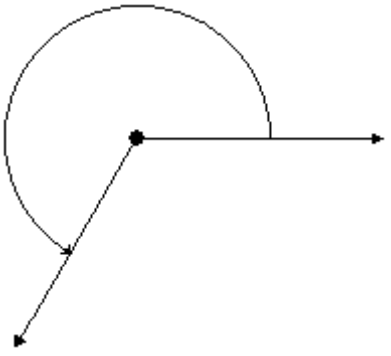
A)



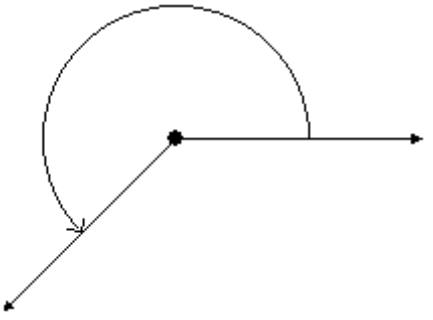
B)



C)



D)



Answer: B

Explanation: A)
B)
C)
D)

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

152) $\frac{\cos\theta}{10}$, if $\theta = 45°$ 152) ____

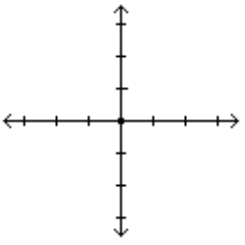
A) $\frac{\sqrt{2}}{20}$ B) $\frac{\sqrt{2}}{10}$ C) $20\sqrt{2}$ D) $5\sqrt{2}$

Answer: A

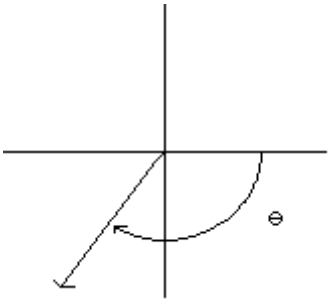
Explanation: A)
B)
C)
D)

Draw the angle having the given radian measure.

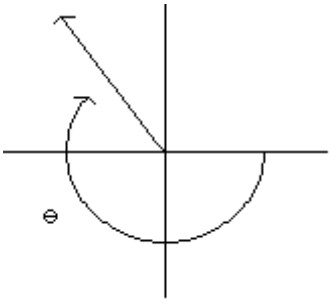
153) $-\frac{2\pi}{3}$ 153) ____



A)



B)



Answer: A

Explanation: A)

B)

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

154) (21, 28) Find csc α. 154) ____

A) $\frac{4}{3}$ B) $\frac{5}{4}$ C) $\frac{3}{4}$ D) $\frac{5}{3}$

Answer: B

Explanation: A)

B)

C)

D)

Solve the problem.

155) Find the acute angle α (in degrees) that satisfies the equation $\alpha = \sin^{-1}\left(\frac{\sqrt{2}}{2}\right)$. 155) ____

A) 45° B) 120° C) 135° D) 60°

Answer: A

Explanation: A)

B)

C)

D)

Evaluate each expression without using a calculator. Give the result in degrees.

156) $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$ 156) ____

A) 135° B) 120° C) 60° D) 45°

Answer: C

Explanation: A)
B)
C)
D)

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

157) sin (-599°) 157) ____

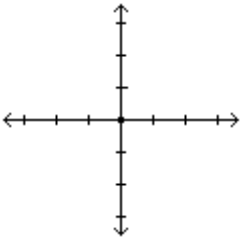
A) 0.8572 B) 0.9998 C) -0.5150 D) 0.4848

Answer: A

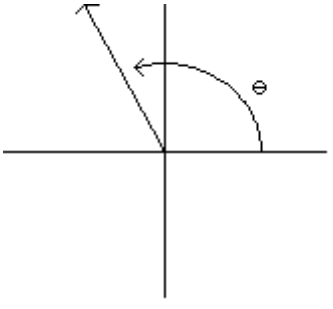
Explanation: A)
B)
C)
D)

Draw the angle having the given radian measure.

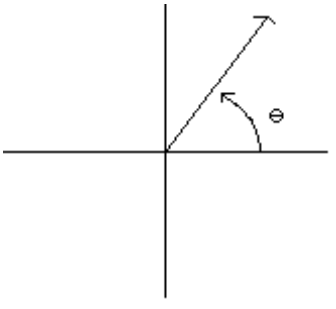
158) 120° 158) ____



A)



B)



Answer: A

Explanation: A)
B)

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

159) -149° 159) ____

A) 211°, -329° B) 31°, -329° C) 31°, -239° D) 211°, -509°

Answer: D

Explanation: A)
B)
C)
D)

Use a calculator to find the acute angle α (to the nearest tenth of a degree) that satisfies the equation.

160) $\sin \alpha = 0.18293545$ 160) ____

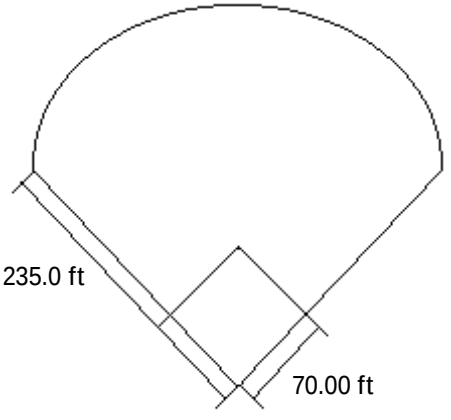
A) 10.5° B) 190.5° C) 169.5° D) 79.5°

Answer: A

Explanation: A)
B)
C)
D)

Solve the problem.

161) The city park district is planning on sodding the outfield of the little league baseball field. The distance from home plate to the outer edge of the infield is 70.00 ft. The angle between the outer edge of the first and third baselines is 90°, and the radius of the sector is 235.0 ft. Determine the area of the outfield. 161) ____



A) 43,370 ft^2 B) 168,600 ft^2 C) 2,480,000 ft^2 D) 38,470 ft^2

Answer: D

Explanation: A)
B)
C)
D)

Find the quadrant that contains the terminal side of angle α.

162) $\cos \alpha > 0$ and $\csc \alpha < 0$ 162) ____

A) I B) II C) III D) IV

Answer: D

Explanation: A)
B)
C)
D)

Use a calculator to find the acute angle α (to the nearest tenth of a degree) that satisfies the equation.

163) $\alpha = \cos^{-1}(0.53359847)$ 163) ____

A) 57.8° B) 122.2° C) 32.2° D) 302.2°

Answer: A

Explanation: A)
B)
C)
D)

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

164) -237°56'55" 164) ____

A) -237.89° B) -237.94° C) -237.95° D) -237.99°

Answer: C

Explanation: A)
B)
C)
D)

Solve the problem.

165) Find the measure of the smaller angle formed by the hands of the clock shown. 165) ____

A) 110° B) 60° C) 120° D) 150°

Answer: C

Explanation: A)
B)
C)
D)

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

166) $\frac{7\pi}{6}$ 166) ____

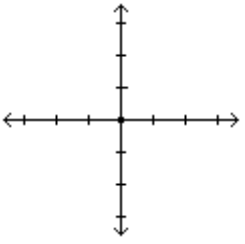
A) 210° B) 154.29π° C) 154.29° D) 420°

Answer: A

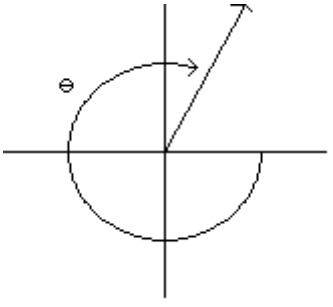
Explanation: A)
B)
C)
D)

Draw the angle having the given radian measure.

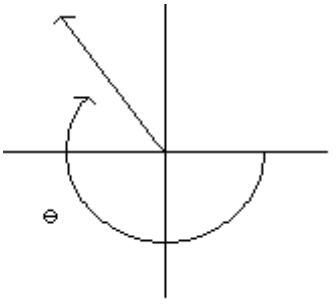
167) -300° 167) ____



A)



B)



Answer: A

Explanation: A)
B)

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

168) 206° 168) ____

A) 566°, -244° B) 476°, -64° C) 566°, -154° D) 386°, -154°

Answer: C

Explanation: A)
B)
C)
D)

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

169) $-\frac{\pi}{3}$ 169) ____

A) $-60°$ B) $-60\pi°$ C) $-1.05°$ D) $\left(-\frac{\pi}{3}\right)^{\circ}$

Answer: A

Explanation: A)
B)
C)
D)

170) 1.4764 170) ____

A) 85.09° B) 83.89° C) 85.59° D) 84.59°

Answer: D

Explanation: A)
B)
C)
D)

Convert the angle to radians. Leave as a multiple of π.

171) 270° 171) ____

A) $-\frac{3\pi}{2}$ B) $\frac{3\pi}{2}$ C) $-\frac{3\pi}{4}$ D) 3π

Answer: B

Explanation: A)
B)
C)
D)

Solve the problem.

172) From a boat on the river below a dam, the angle of elevation to the top of the dam is 15°4'. If the dam is 2492 feet above the level of the river, how far is the boat from the base of the dam (to the nearest foot)? 172) ____

A) 9237 ft B) 9227 ft C) 9247 ft D) 9257 ft

Answer: D

Explanation: A)
B)
C)
D)

173) The angle of elevation from a point on the ground to the top of a tower is 38° 44'. The angle of elevation from a point 117 feet farther back from the tower is 28° 45'. Find the height of the tower (to the nearest foot). 173) ____

A) 214 ft B) 199 ft C) 2031 ft D) 203 ft

Answer: D

Explanation: A)
B)
C)
D)

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

174) $\tan \frac{5\pi}{4}$ 174) ____

A) $\frac{\sqrt{3}}{3}$ B) $\sqrt{3}$ C) -1 D) 1

Answer: D

Explanation: A)
B)
C)
D)

Find the quadrant that contains the terminal side of angle α.

175) $\sin \alpha > 0$ and $\cot \alpha > 0$ 175) ____

A) I B) II C) III D) IV

Answer: A

Explanation: A)
B)
C)
D)

Use a calculator to evaluate the expression. Round approximate answers to four decimal places.

176) $\frac{1 + \sin(37.6°)}{3}$ 176) ____

A) 0.1300 B) 0.3004 C) 0.5974 D) 0.5367

Answer: D

Explanation: A)
B)
C)
D)

Find the exact value of the expression.

177) $\frac{\sin(5\pi/4)}{\cos(5\pi/4)}$ 177) ____

A) -1 B) $\frac{\sqrt{2}}{2}$ C) $-\frac{\sqrt{2}}{2}$ D) 1

Answer: D

Explanation: A)
B)
C)
D)

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

178) $\cos\left(\frac{7\pi}{6}\right)$ 178) ____

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{2\sqrt{3}}{3}$

Answer: A

Explanation: A)
B)
C)
D)

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

179) cos (63.6°) 179) ____

A) 0.7192 B) 0.8957 C) 0.4446 D) 2.0145

Answer: C

Explanation: A)
B)
C)
D)

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

180) $\frac{5}{2}\pi$ 180) ____

A) $900\pi°$ B) 7.85° C) 450° D) 225°

Answer: C

Explanation: A)
B)
C)
D)

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

181) $(8, 3)$ Find $\cot \alpha$. 181) ____

A) $\frac{8}{3}$ B) $\frac{3}{8}$ C) $\frac{1}{3}$ D) $\frac{8}{9}$

Answer: A

Explanation: A)
B)
C)
D)

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

182) $\sec \alpha$, if $\cos \alpha = \frac{\sqrt{15}}{4}$ 182) ____

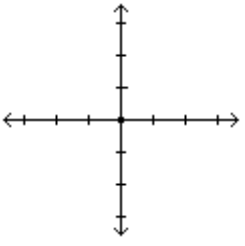
A) $\frac{4\sqrt{15}}{15}$ B) $\sqrt{15}$ C) $\frac{\sqrt{15}}{15}$ D) 4

Answer: A

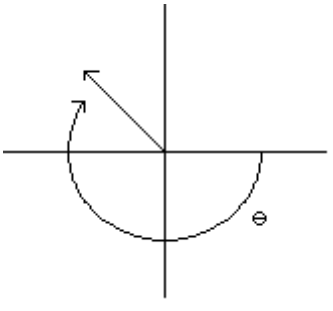
Explanation: A)
B)
C)
D)

Draw the angle having the given radian measure.

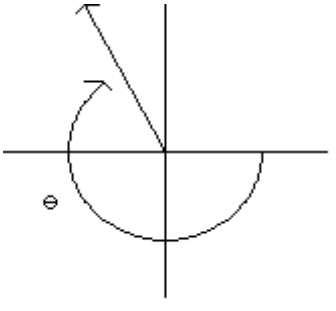
183) $-\frac{4\pi}{3}$ 183) ____



A)



B)



Answer: B

Explanation: A)
B)

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

184) $\frac{\cos \theta}{6}$, if $\theta = 45°$ 184) ____

A) $\frac{\sqrt{2}}{6}$ B) $12\sqrt{2}$ C) $\frac{6\sqrt{2}}{2}$ D) $\frac{\sqrt{2}}{12}$

Answer: D

Explanation: A)
B)
C)
D)

Find the measure in radians of the smallest possible angle that is coterminal with the given angle. For angles given in terms of π, express the answer in terms of π. Otherwise, round to the nearest hundredth.

185) $\frac{17\pi}{8}$ 185) ____

A) $\frac{9\pi}{8}$ B) $-\frac{\pi}{8}$ C) $\frac{\pi}{8}$ D) $\frac{7\pi}{8}$

Answer: C

Explanation: A)
B)
C)
D)

Find the reference angle for the given angle.

186) $157°$ 186) ____

A) $67°$ B) $33°$ C) $77°$ D) $23°$

Answer: D

Explanation: A)
B)
C)
D)

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

187) $\frac{\pi}{7}$ 187) ____

A) $\frac{\pi}{7} + 360°, \frac{\pi}{7} - 360°$ B) $\frac{15\pi}{7}, -\frac{\pi}{7}$

C) $\frac{15\pi}{7}, -\frac{13\pi}{7}$ D) $\frac{8\pi}{7}, -\frac{6\pi}{7}$

Answer: C

Explanation: A)
B)
C)
D)

Determine if the equation is true or false.

188) $\sin\left(\frac{2\pi}{7}\right) = \sin\left(-\frac{16\pi}{7}\right)$ 188) ____

A) False B) True

Answer: A

Explanation: A)
B)

Solve the problem.

189) A wheel is rotating at 3 radians/sec, and the wheel has a 71-inch diameter. To the nearest foot per minute, what is the linear velocity of a point on the rim? 189) ____

A) 523 ft/min B) 538 ft/min C) 528 ft/min D) 533 ft/min

Answer: D

Explanation: A)
B)
C)
D)

For the given angle, name the quadrant in which the terminal side lies.

190) $-\frac{13\pi}{12}$ 190) ____

A) IV B) I C) II D) III

Answer: C

Explanation: A)
B)
C)
D)

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

191) $\tan 45°$ 191) ____

A) $\sqrt{2}$ B) $\frac{\sqrt{2}}{2}$ C) 1 D) $\frac{\sqrt{3}}{2}$

Answer: C

Explanation: A)
B)
C)
D)

Solve the problem.

192) Two wheels are rotating in such a way that the rotation of the smaller wheel causes the larger wheel to rotate. The radius of the smaller wheel is 7.2 centimeters and the radius of the larger wheel is 21.5 centimeters. Through how many degrees will the larger wheel rotate if the smaller one rotates 131°? 192) ____

A) 43.77° B) 45.87° C) 43.87° D) 44.87°

Answer: C

Explanation: A)
B)
C)
D)

For the given angle, name the quadrant in which the terminal side lies.

193) 879° 193) ____

A) I B) II C) III D) IV

Answer: B

Explanation: A)
B)
C)
D)

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

194) 7 194) ____

A) 401.17° B) 802.04° C) 802.14° D) 401.07°

Answer: D

Explanation: A)
B)
C)
D)

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

195) 9 cos θ, if $\theta = 45°$ 195) ____

A) $-\frac{\sqrt{2}}{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{9\sqrt{2}}{2}$ D) $-\frac{9\sqrt{2}}{2}$

Answer: C

Explanation: A)
B)
C)
D)

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

196) $90° - 32°17'41"$ 196) ____

A) $57°42'19"$ B) $57°43'19"$ C) $57°42'18"$ D) $58°43'19"$

Answer: A

Explanation: A)
B)
C)
D)

197) $313°44' + 271°56'$ 197) ____

A) $41°100'$ B) $41°40'$ C) $585°100'$ D) $585°40'$

Answer: D

Explanation: A)
B)
C)
D)

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

198) $\csc \frac{5\pi}{3}$ 198) ____

A) $-\sqrt{2}$ B) $-\sqrt{3}$ C) $-\frac{1}{2}$ D) $-\frac{2\sqrt{3}}{3}$

Answer: D

Explanation: A)
B)
C)
D)

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

199) $(9, 9)$; $\cos \alpha$ 199) ____

A) $\frac{9}{\sqrt{162}}$ B) 1 C) $\frac{9}{\sqrt{162}}$ D) $\frac{\sqrt{162}}{9}$

Answer: A

Explanation: A)
B)
C)
D)

Find the area of a sector with the given central angle α in a circle of radius r.

200) $\alpha = \frac{\pi}{2}$, r = 12 cm 200) ____

A) 3π sq cm B) 6π sq cm C) 36π sq cm D) 72π sq cm

Answer: C

Explanation: A)
B)
C)
D)

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

201) $\frac{\pi}{4}$ 201) ____

A) $45\pi°$ B) $\left(\frac{\pi}{4}\right)^{\circ}$ C) 45° D) 0.785°

Answer: C

Explanation: A)
B)
C)
D)

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

202) sin (64.1°) 202) ____

A) 2.0594 B) 0.9546 C) 0.8996 D) 0.4368

Answer: C

Explanation: A)
B)
C)
D)

Find the quadrant that contains the terminal side of angle α.

203) $\sin \alpha < 0$ and $\tan \alpha < 0$ 203) ____

A) I B) II C) III D) IV

Answer: D

Explanation: A)
B)
C)
D)

Solve the right triangle with the given sides and angles.

204) $\beta = 43.9°$, $c = 3.6$ 204) ____

A) $a = 1.8$, $\alpha = 46.1°$, $b = 3.1$

B) $a = 2.6$, $\alpha = 46.1°$, $b = 2.5$

C) $a = 2.6$, $\alpha = 46.1°$, $b = 1.8$

D) $a = 2.5$, $\alpha = 46.1°$, $b = 2.6$

Answer: B

Explanation: A)

B)

C)

D)

Convert the angle to radians. Leave as a multiple of π.

205) $234°$ 205) ____

A) $\frac{13\pi}{5}$ B) $\frac{14\pi}{5}$ C) $\frac{13\pi}{10}$ D) $\frac{7\pi}{10}$

Answer: C

Explanation: A)

B)

C)

D)

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

206) $\frac{\pi}{6}$ 206) ____

A) $\frac{\pi}{6} + 360°, \frac{\pi}{6} - 360°$

B) $\frac{7\pi}{6}, -\frac{5\pi}{6}$

C) $\frac{13\pi}{6}, -\frac{\pi}{6}$

D) $\frac{13\pi}{6}, -\frac{11\pi}{6}$

Answer: D

Explanation: A)

B)

C)

D)

Solve the problem.

207) Find $\cos(\alpha)$, given that $\sin(\alpha) = \frac{4}{7}$ and $\cos(\alpha) < 0$. 207) ____

A) $-\frac{\sqrt{33}}{7}$ B) $-\frac{3}{7}$ C) $\frac{\sqrt{33}}{7}$ D) $\frac{3}{7}$

Answer: A

Explanation: A)

B)

C)

D)

Solve.

208) The formula $d = \frac{1}{32} v_0^2 \sin(2\theta)$ gives the distance d in feet that a projectile will travel when its launch angle is θ and its initial velocity is v_0 feet per second. Approximately what initial velocity in miles per hour does it take to throw a javelin 330 feet with a launch angle 43°? 208) ____

A) 156.84 miles per hour B) 102.89 miles per hour
C) 182.5 miles per hour D) 150.9 miles per hour

Answer: D
Explanation: A)
B)
C)
D)

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

209) -16°42'7" 209) ____

A) -16.69° B) -16.64° C) -16.70° D) -16.74°

Answer: C
Explanation: A)
B)
C)
D)

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

210) cos (-684°) 210) ____

A) 0.4067 B) 0.5878 C) 0.8090 D) 0.9945

Answer: C
Explanation: A)
B)
C)
D)

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

211) 90° - 8°42' 211) ____

A) 81°42' B) 82°18' C) 82°42' D) 81°18'

Answer: D
Explanation: A)
B)
C)
D)

Solve the problem.

212) Find the acute angle α (in degrees) that satisfies the equation $\sin \alpha = \left(\frac{\sqrt{2}}{2}\right)$. 212) ____

A) 60° B) 45° C) 135° D) 120°

Answer: B

Explanation: A)
B)
C)
D)

213) From a balloon 939 feet high, the angle of depression to the ranger headquarters is 80°50'. How far is the headquarters from a point on the ground directly below the balloon (to the nearest foot)? 213) ____

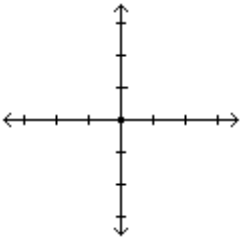
A) 152 ft B) 157 ft C) 142 ft D) 147 ft

Answer: A

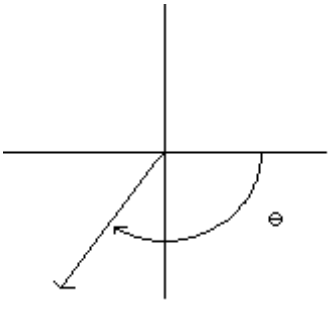
Explanation: A)
B)
C)
D)

Draw the angle having the given radian measure.

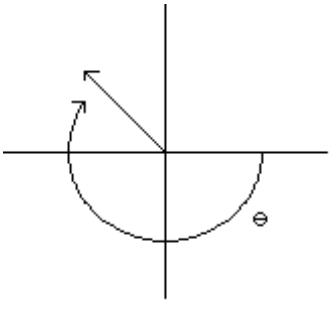
214) $-\frac{5\pi}{4}$ 214) ____



A)



B)



Answer: B

Explanation: A)
B)

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

215) $(-10, 24)$; $\sin \alpha$ 215) ____

A) $\frac{5}{13}$ B) $\frac{12}{13}$ C) $-\frac{5}{13}$ D) $-\frac{12}{13}$

Answer: B

Explanation: A)

B)

C)

D)

Answer Key
Testname: C1

1) B
2) C
3) B
4) C
5) A
6) C
7) B
8) B
9) B
10) D
11) C
12) C
13) D
14) B
15) A
16) C
17) C
18) D
19) C
20) D
21) D
22) B
23) A
24) C
25) A
26) B
27) A
28) A
29) C
30) B
31) D
32) B
33) C
34) C
35) C
36) B
37) D
38) A
39) D
40) C
41) A
42) A

43) D
44) D
45) D
46) D
47) A
48) D
49) C
50) A
51) B
52) A
53) B
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58) D
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64) D
65) C
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69) C
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71) A
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80) D
81) A
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84) B

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203) D
204) B
205) C
206) D
207) A
208) D
209) C
210) C

211) D
212) B
213) A
214) B
215) B