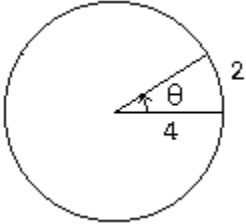


**Solve the problem.**

- 1) Use the figure below to determine the radian measure of angle  $\theta$ . Round to two decimal places, if necessary.



4)  $-45^\circ$

5)  $210^\circ$

- 2) Find the length of the arc intercepted by a central angle of  $328^\circ$  in a circle of radius 9 mi. Round to two decimal places, if necessary.

6)  $216^\circ$

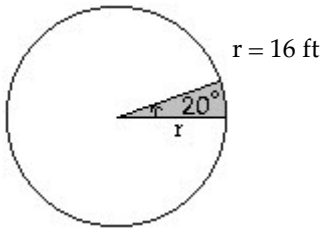
7)  $1440^\circ$

**Convert the angle to radians. Leave as a multiple of  $\pi$ .**

- 3)  $90^\circ$

**Solve the problem.**

- 8) Find the area of the shaded sector. Round to one decimal place.



- 9) Find the area of the work space for a robotic arm that can rotate between  $-30^\circ$  and  $45^\circ$  and can change its length from 3 inches to 20 inches. Round to one decimal place.

- 10) A bicycle wheel rotates 93 times in 1 minute. Through how many degrees does a point on the tip of the wheel move in 9 seconds?

- 11) Find the distance in kilometers between the cities whose latitudes are given. Assume that the cities are on a north-south line and that the radius of the earth is 6400 km. City A,  $21^\circ\text{N}$  and city B,  $35^\circ\text{N}$

- 12) Two pulleys of diameter 9 m and 3 m are connected by a belt. The larger pulley rotates 49 times per min. Find the angular velocity of the smaller pulley.

**Approximate the trigonometric expression to four decimal places using a calculator.**

13)  $\cos 38^\circ$

14)  $\cot 22^\circ 21'$

**Solve the problem.**

- 15) From a distance of 40 feet from the base of a building, the angle of elevation to the top of the building is  $62^\circ$ . Estimate the height of the building to the nearest foot.

18)  $\sin\left(\frac{11\pi}{6}\right)$

- 16) A kite is currently flying at an altitude of 18 meters above the ground. If the angle of elevation from the ground to the kite is  $32^\circ$ , find the length of the kite string to the nearest meter.

19)  $\cos\left(\frac{2\pi}{3}\right)$

20)  $\sin(30^\circ)$

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

17)  $\cot(45^\circ)$

21)  $\cos(60^\circ)$

$$22) \sin(0^\circ)$$

$$26) \sin(12^\circ 50')$$

$$23) \cos\left(-\frac{7\pi}{6}\right)$$

$$27) \cos(1.77)$$

$$24) \sin(-60^\circ)$$

$$28) \cos\left(\frac{4\pi}{9}\right)$$

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

$$25) \cos(19.3^\circ)$$

$$29) \sin(0.3)$$

**Evaluate the following.**

30)  $\sin^{-1} -0.47$  (Approximate to a hundredth of a radian.)

31)  $\arccos -\frac{1}{11}$  (Approximate to a tenth of a degree.)

32)  $\tan^{-1}(8.7)$  (Approximate to a hundredth of a radian.)

33)  $\cos^{-1} 1.7$  (Approximate to a tenth of a degree.)

**Solve the equation.**

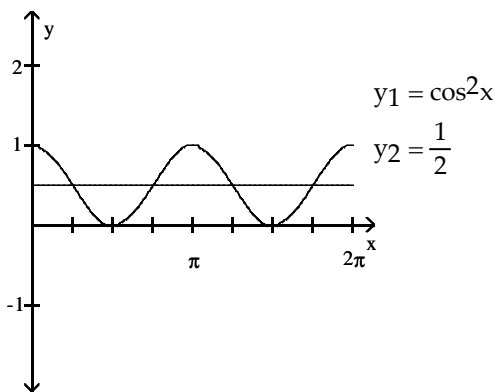
34) Solve  $7 \sin \theta = 0.63$  for  $\theta$ , where  $\theta$  is an acute angle. Approximate  $\theta$  to the nearest hundredth of a degree.

35) Solve  $4 \tan \theta - 5 = 7$  for  $\theta$ , where  $\theta$  is an acute angle. Approximate  $\theta$  to the nearest tenth of a degree.

36) Solve  $\cos^2 \theta - 0.23 = 0.57$  for  $\theta$ , where  $\theta$  is an acute angle. Approximate  $\theta$  to the nearest tenth of a degree.

Use the graph to estimate any solutions to the given equation on the interval  $0 \leq x < 2\pi$ .

37)  $\cos^2 x = \frac{1}{2}$

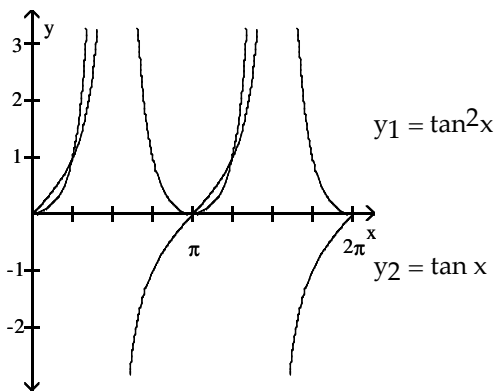


Factor and simplify the expression.

39)  $1 - 2 \sin^2 x + \sin^4 x$

40)  $\frac{\sin^2 x - 1}{\sin x + 1}$

38)  $\tan x = \tan^2 x$



41)  $\sec^4 x - 2 \sec^2 x \tan^2 x + \tan^4 x$

42)  $\sin^2 x + \sin^2 x \cot^2 x$

$$43) \tan^4 x - \sec^4 x$$

$$47) \cos x = \sin x$$

$$44) 1 - \sin^3 x$$

$$48) \csc^5 x - 4 \csc x = 0$$

**Solve the equation for the interval  $[0, 2\pi)$ .**

$$45) \cos^2 x + 2 \cos x + 1 = 0$$

**Use a strictly graphical approach to solve the equation over the interval  $[0, 2\pi)$ . Express solutions to the nearest hundredth.**

$$49) 2 \sin x = 1 + \cos x$$

$$46) 2 \sin^2 x = \sin x$$

$$50) e^x = \cos x + 2$$

$$51) \ln x = \sin x$$

$$55) 2\sqrt{3} \sin 4x = 3$$

$$52) \sin^3 x + \cos x + 1 = 0$$

**Solve the equation exactly over the interval  $[0, 360^\circ)$ .**

$$56) \tan^2 2\theta = 5$$

**Solve the equation for all values  $0 \leq x \leq 2\pi$ .**

$$53) \sin 4x = \frac{\sqrt{3}}{2}$$

$$57) \cos^2 \frac{\theta}{2} = 1$$

$$54) \sin x \cos x = \frac{1}{2}$$

$$58) \sin 2\theta + \cos 2\theta = 1$$

**Solve the equation exactly over the interval  $[0, 2\pi)$ .**

59)  $\tan 2x - \tan x = 0$

60)  $\sec \frac{x}{2} = \cos \frac{x}{2}$

# Answer Key

## Testname: TRIGREVIEW

- 1) 0.5 radians
- 2) 51.52 mi
- 3)  $\frac{\pi}{2}$
- 4)  $-\frac{\pi}{4}$
- 5)  $\frac{7\pi}{6}$
- 6)  $\frac{6\pi}{5}$
- 7)  $8\pi$
- 8) 44.7 square feet
- 9) 255.9 square inches
- 10)  $5022^\circ$
- 11) 1564 km
- 12)  $294\pi$  radians/min
- 13) 0.788
- 14) 2.4322
- 15) 75 feet
- 16) 34 meters
- 17) 1
- 18)  $-\frac{1}{2}$
- 19)  $-\frac{1}{2}$
- 20)  $\frac{1}{2}$
- 21)  $\frac{1}{2}$
- 22) 0
- 23)  $-\frac{\sqrt{3}}{2}$
- 24)  $-\frac{\sqrt{3}}{2}$
- 25) 0.9438
- 26) 0.2221
- 27) -0.1979
- 28) 0.1736
- 29) 0.2955
- 30) -0.49
- 31)  $95.2^\circ$
- 32) 1.46
- 33) Undefined
- 34)  $5.16^\circ$
- 35)  $71.6^\circ$
- 36)  $26.6^\circ$
- 37)  $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$
- 38)  $0, \frac{\pi}{4}, \pi, \frac{5\pi}{4}$
- 39)  $\cos^4 x$
- 40)  $\sin x - 1$
- 41) 1
- 42) 1
- 43)  $-2 \tan^2 x - 1$
- 44)  $(1 - \sin x)(1 + \sin x + \sin^2 x)$
- 45)  $x = \pi$
- 46)  $x = 0, \pi, \frac{\pi}{6}, \frac{5\pi}{6}$
- 47)  $x = \frac{\pi}{4}, \frac{5\pi}{4}$
- 48)  $x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$
- 49)  $x = 0.93, 3.14$
- 50)  $x = 0.95$
- 51)  $x = 2.22$
- 52) 3.14, 3.72, 4.71
- 53)  $x = \frac{\pi}{12}, \frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{12}, \frac{7\pi}{6}, \frac{13\pi}{12}, \frac{5\pi}{3}, \frac{19\pi}{12}$
- 54)  $x = \frac{\pi}{4}, \frac{5\pi}{4}$
- 55)  $x = \frac{\pi}{12}, \frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{12}, \frac{7\pi}{6}, \frac{13\pi}{12}, \frac{5\pi}{3}, \frac{19\pi}{12}$
- 56)  $\{33^\circ, 57^\circ, 123^\circ, 147^\circ, 213^\circ, 237^\circ, 303^\circ, 327^\circ\}$
- 57)  $\{0^\circ\}$
- 58)  $\{0^\circ, 45^\circ, 180^\circ, 225^\circ\}$
- 59)  $\{0, \pi\}$
- 60)  $\{0\}$