

Trigonometric Functions

Angle Measures, Trigonometric Functions, and Identities

Convert the angle from degrees to radians. Express the answer as a multiple of π .

1) 252°

2) 810°

3) 1800°

Convert the angle from radians to degrees.

4) $-\frac{11\pi}{6}$

5) $\frac{4\pi}{7}$

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

7) $\frac{7\pi}{3}$

Determine the quadrant in which the terminal side lies.

8) 54°

9) -480°

10) $\frac{9\pi}{4}$

11) $-\frac{35\pi}{9}$

Find the length of the arc on the circle of radius r meters intercepted by a central angle θ . Round your answer to three decimal places.

12) $r = 11, \theta = 75^\circ$

13) $r = 4, \theta = \frac{\pi}{5}$

- 14) A car wheel has a 15-inch radius. Through what angle (to the nearest tenth of a degree) does the wheel turn when the car rolls forward 4 ft?
- 15) A wheel with a 34-inch radius is marked at two points on the rim. The distance between the marks along the wheel is found to be 19 inches. What is the angle (to the nearest tenth of a degree) between the radii to the two marks?
- 16) From a boat on the lake, the angle of elevation to the top of a cliff is $18^{\circ}43'$. If the base of the cliff is 1973 feet from the boat, how high is the cliff (to the nearest foot)?
- 17) A 35-foot ladder is leaning against the side of a building. If the ladder makes an angle of $22^{\circ}58'$ with the side of the building, how far is the bottom of the ladder from the base of the building?

Evaluate the trigonometric function.

18) $\tan 270^{\circ}$

19) $\sin -1170^{\circ}$

20) $\cos \frac{25\pi}{2}$

21) $\sin -7\pi$

Evaluate without using a calculator.

22) $\sin \theta$, if $\cos \theta = \frac{4}{9}$, and $\tan \theta < 0$.

23) $\cos \theta$, if $\tan \theta = -\frac{10}{7}$, and $\sin \theta > 0$.

24) $\sin \theta$, if $\tan \theta = \frac{1}{5}$, and $\cos \theta < 0$.

25) $\tan \theta$, if $\cos \theta = \frac{4}{7}$, and $\sin \theta < 0$.

Determine the sign (positive or negative) of the given value without use of a calculator.

26) $\cos 250^\circ$

27) $\sin 171^\circ$

28) $\sin \frac{9\pi}{8}$

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

Find the exact value.

30) $\sin \theta = \frac{\sqrt{3}}{2}$ in Quadrant I

a) $\sin (180 + \theta)$

b) $\sin (180 - \theta)$

c) $\sin (90 - \theta)$

d) $\sin (-\theta)$

e) $\cos \theta$

f) $\tan \theta$

31) $\cos \theta = -\frac{\sqrt{2}}{2}$ in Quadrant III

a) $\cos (180 + \theta)$

b) $\cos (180 - \theta)$

c) $\cos (90 - \theta)$

d) $\cos (-\theta)$

e) $\sin \theta$

f) $\tan \theta$