

Trigonometric Functions

Angle Measures, Trigonometric Functions, and Identities 2

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

1) 288°

2) -450°

3) 1080°

Convert the angle from radians to degrees.

4) $-\frac{7\pi}{10}$

5) $\frac{2\pi}{7}$

6) $-\frac{\pi}{3}$

7) $-\frac{53\pi}{18}$

Determine the quadrant in which the terminal side lies.

8) 150°

9) -150°

10) $\frac{5\pi}{12}$

11) $-\frac{7\pi}{2}$

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) $r = 9, \theta = 55^\circ$

13) $r = 10, \theta = \frac{\pi}{5}$

- 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 2 ft?
- 15) A wheel with a 24-inch radius is marked at two points on the rim. The distance between the marks along the wheel is found to be 8 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 $28^{\circ}47'$. If the base of the cliff is 101 feet from the boat, how high is the cliff (to the nearest foot)?
- 17) A 31-foot ladder is leaning against the side of a building. If the ladder makes an angle of $25^{\circ}6'$ 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) $\tan 630^{\circ}$

19) $\sin -450^{\circ}$

20) $\cos \frac{13\pi}{2}$

21) $\sin -3\pi$

Evaluate without using a calculator.

22) $\sin \theta$, if $\cos \theta = \frac{2}{9}$, and $\tan \theta < 0$.

23) $\cos \theta$, if $\tan \theta = -\frac{10}{3}$, and $\sin \theta > 0$.

24) $\sin \theta$, if $\tan \theta = \frac{1}{6}$, and $\cos \theta < 0$.

25) $\tan \theta$, if $\cos \theta = -\frac{3}{7}$, and $\sin \theta < 0$.

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

26) $\cos 212^\circ$

27) $\sin 166^\circ$

28) $\sin \frac{7\pi}{6}$

29) $\sin -\frac{\pi}{9}$

Find the exact value.

30) $\sin \theta = \frac{1}{5}$ 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) $\cos \theta = -\frac{4}{9}$ in Quadrant III

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

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

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

d) $\cos (-\theta)$

e) $\sin \theta$

f) $\tan \theta$