

Evaluating Trigonometric Functions

Evaluating Sine, Cosine, and Tangent In Exercises 23, 24, 25, 26, 27, 28, 29, 30, 31, and 32, evaluate (if possible) the sine, cosine, and tangent of the real number.

23. $t = \frac{\pi}{4}$

24. $t = \frac{\pi}{3}$

25. $t = -\frac{7\pi}{4}$

26. $t = -\frac{5\pi}{4}$

27. $t = \frac{2\pi}{3}$

28. $t = \frac{5\pi}{3}$

Evaluating Trigonometric Functions In Exercises 33, 34, 35, 36, 37, and 38, evaluate (if possible) the six trigonometric functions of the real number.

33. $t = 3\pi/4$

34. $t = 5\pi/6$

35. $t = 2\pi$

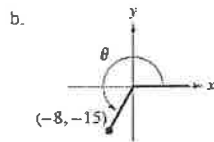
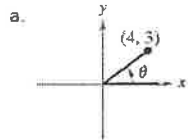
36. $t = 3\pi/2$

37. $t = -4\pi/3$

38. $t = 7\pi/4$

Evaluating Trigonometric Functions In Exercises 11, 12, 13, and 14, determine the exact values of the six trigonometric functions of the angle θ .

11.



Evaluating Trigonometric Functions In Exercises 15, 16, 17, 18, 19, 20, 21, and 22, the point is on the terminal side of an angle in standard position. Determine the exact values of the six trigonometric functions of the angle.

15. $(7, 24)$

16. $(8, 15)$

17. $(5, -12)$

18. $(-24, 10)$

19. $(-\sqrt{21}, 2)$

Determining a Quadrant In Exercises 23, 24, 25, and 26, state the quadrant in which θ lies.

23. $\sin \theta < 0$ and $\cos \theta < 0$

24. $\sec \theta > 0$ and $\cot \theta < 0$

25. $\cot \theta > 0$ and $\cos \theta > 0$

26. $\tan \theta > 0$ and $\csc \theta < 0$

Evaluating Trigonometric Functions In Exercises 27, 28, 29, 30, 31, 32, 33, and 34, find the values of the six trigonometric functions of θ .

27.

Function Value	Constraint
$\sin \theta = \frac{3}{5}$	θ lies in Quadrant II.

28.

Function Value	Constraint
$\cos \theta = -\frac{4}{5}$	θ lies in Quadrant III.

29.

Function Value	Constraint
$\tan \theta = -\frac{15}{8}$	$\sin \theta < 0$

30.

Function Value	Constraint
$\csc \theta = 4$	$\cot \theta < 0$

31.

Function Value	Constraint
$\sec \theta = -2$	$0 \leq \theta \leq \pi$

Trigonometric Function of a Quadrant Angle In Exercises 39, 40, 41, 42, 43, 44, 45, and 46, evaluate the trigonometric function of the quadrant angle.

39. $\sec \pi$

40. $\tan \frac{\pi}{2}$

41. $\sec \frac{3\pi}{2}$

42. $\csc 0$

43. $\csc \frac{3\pi}{2}$

Trigonometric Functions of a Nonacute Angle In Exercises 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, and 78, evaluate the sine, cosine, and tangent of the angle without using a calculator.

67. 225°

68. 300°

69. -750°

70. -495°

71. $5\pi/3$

Using Trigonometric Identities In Exercises 79, 80, 81, 82, 83, and 84, find the indicated trigonometric value in the specified quadrant.

79.

Function	Quadrant	Trigonometric Value
$\sin \theta = -\frac{3}{5}$	IV	$\cos \theta$

80.

Function	Quadrant	Trigonometric Value
$\cot \theta = -3$	II	$\sin \theta$

81.

Function	Quadrant	Trigonometric Value
$\csc \theta = -2$	IV	$\cot \theta$

82.

Function	Quadrant	Trigonometric Value
$\cos \theta = \frac{5}{8}$	I	$\sec \theta$

Using Trigonometric Identities In Exercises 85, 86, 87, 88, 89, and 90, use the given value and the trigonometric identities to find the remaining trigonometric functions of the angle.

85. $\sin \theta = \frac{2}{5}, \cos \theta > 0$

86. $\cos \theta = -\frac{3}{7}, \sin \theta < 0$

87. $\tan \theta = -4, \cos \theta < 0$

88. $\cot \theta = 5, \sin \theta > 0$

89. $\csc \theta = -\frac{3}{2}, \tan \theta < 0$

90. $\sec \theta = -\frac{4}{3}, \cot \theta > 0$

Solving for θ In Exercises 103, 104, 105, 106, 107, and 108, find two solutions of each equation. Give your solutions in both degrees ($0^\circ \leq \theta < 360^\circ$) and radians ($0 \leq \theta < 2\pi$). Do not use a calculator.

103.

a. $\sin \theta = \frac{1}{2}$

b. $\sin \theta = -\frac{1}{2}$

104.

a. $\cos \theta = \frac{\sqrt{2}}{2}$

b. $\cos \theta = -\frac{\sqrt{2}}{2}$

105.

a. $\csc \theta = \frac{2\sqrt{3}}{3}$

b. $\cot \theta = -1$

106.

a. $\cot \theta = -\sqrt{3}$

b. $\csc \theta = 2$

107.

a. $\sec \theta = -\frac{2\sqrt{3}}{3}$

b. $\tan \theta = -\frac{\sqrt{3}}{3}$

108.

a. $\tan \theta = 1$

b. $\sec \theta = \sqrt{2}$