

Worksheet 14 - The Unit Circle: Sine and Cosine (§6.2)

Exercises 1 - 20, compute the exact value of the cosine and sine of the given angle.

1. $\theta = 0$

2. $\theta = \frac{\pi}{4}$

3. $\theta = \frac{\pi}{3}$

4. $\theta = \frac{\pi}{2}$

5. $\theta = \frac{2\pi}{3}$

6. $\theta = \frac{3\pi}{4}$

7. $\theta = \pi$

8. $\theta = \frac{7\pi}{6}$

9. $\theta = \frac{5\pi}{4}$

10. $\theta = \frac{4\pi}{3}$

11. $\theta = \frac{3\pi}{2}$

12. $\theta = \frac{5\pi}{3}$

13. $\theta = \frac{7\pi}{4}$

14. $\theta = \frac{23\pi}{6}$

15. $\theta = -\frac{13\pi}{2}$

16. $\theta = -\frac{43\pi}{6}$

17. $\theta = -\frac{3\pi}{4}$

18. $\theta = -\frac{\pi}{6}$

19. $\theta = \frac{10\pi}{3}$

20. $\theta = 117\pi$

In Exercises 21 - 30, compute the requested value.

21. If $\sin(\theta) = -\frac{7}{25}$ with θ in Quadrant IV, what is $\cos(\theta)$?

22. If $\cos(\theta) = \frac{4}{9}$ with θ in Quadrant I, what is $\sin(\theta)$?

23. If $\sin(\theta) = \frac{5}{13}$ with θ in Quadrant II, what is $\cos(\theta)$?

24. If $\cos(\theta) = -\frac{2}{11}$ with θ in Quadrant III, what is $\sin(\theta)$?

25. If $\sin(\theta) = -\frac{2}{3}$ with θ in Quadrant III, what is $\cos(\theta)$?

26. If $\cos(\theta) = \frac{28}{53}$ with θ in Quadrant IV, what is $\sin(\theta)$?

27. If $\sin(\theta) = \frac{2\sqrt{5}}{5}$ and $\frac{\pi}{2} < \theta < \pi$, what is $\cos(\theta)$?

28. If $\cos(\theta) = \frac{\sqrt{10}}{10}$ and $2\pi < \theta < \frac{5\pi}{2}$, what is $\sin(\theta)$?

29. If $\sin(\theta) = -0.42$ and $\pi < \theta < \frac{3\pi}{2}$, what is $\cos(\theta)$?

30. If $\cos(\theta) = -0.98$ and $\frac{\pi}{2} < \theta < \pi$, what is $\sin(\theta)$?

In Exercises 31 - 39, compute all of the angles which satisfy the given equation.

31. $\sin(\theta) = \frac{1}{2}$

32. $\cos(\theta) = -\frac{\sqrt{3}}{2}$

33. $\sin(\theta) = 0$

34. $\cos(\theta) = \frac{\sqrt{2}}{2}$

35. $\sin(\theta) = \frac{\sqrt{3}}{2}$

36. $\cos(\theta) = -1$

37. $\sin(\theta) = -1$

38. $\cos(\theta) = \frac{\sqrt{3}}{2}$

39. $\cos(\theta) = -1.001$

In Exercises 40 - 48, solve the equation for t .

40. $\cos(t) = 0$

41. $\sin(t) = -\frac{\sqrt{2}}{2}$

42. $\cos(t) = 3$

43. $\sin(t) = -\frac{1}{2}$

44. $\cos(t) = \frac{1}{2}$

45. $\sin(t) = -2$

46. $\cos(t) = 1$

47. $\sin(t) = 1$

48. $\cos(t) = -\frac{\sqrt{2}}{2}$

In Exercises 49 - 54, use a calculator or computer to approximate the given value to three decimal places. Make sure your device is in the proper angle measurement mode!

49. $\sin(78.95^\circ)$

50. $\cos(-2.01)$

51. $\sin(392.994)$

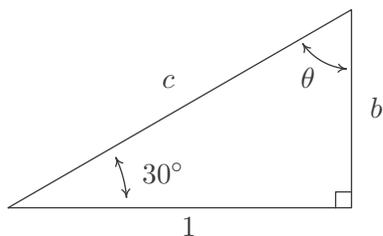
52. $\cos(207^\circ)$

53. $\sin(\pi^\circ)$

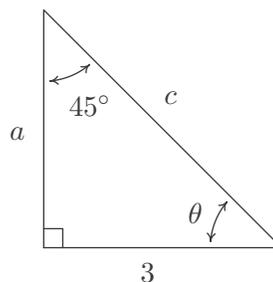
54. $\cos(e)$

In Exercises 55 - 58, compute the measurement of the missing angle and the lengths of the missing sides.

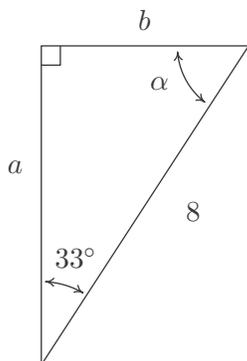
55. Compute θ , b , and c .



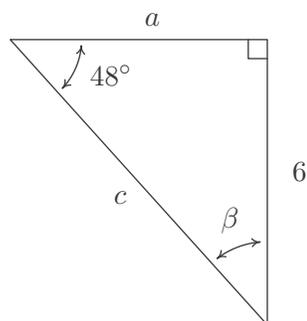
56. Compute θ , a , and c .



57. Compute α , a , and b .



58. Compute β , a , and c .



In Exercises 59 - 64, assume that θ is an acute angle in a right triangle and compute the requested side.

59. If $\theta = 12^\circ$ and the side adjacent to θ has length 4, how long is the hypotenuse?
60. If $\theta = 78.123^\circ$ and the hypotenuse has length 5280, how long is the side adjacent to θ ?
61. If $\theta = 59^\circ$ and the side opposite θ has length 117.42, how long is the hypotenuse?
62. If $\theta = 5^\circ$ and the hypotenuse has length 10, how long is the side opposite θ ?
63. If $\theta = 5^\circ$ and the hypotenuse has length 10, how long is the side adjacent to θ ?
64. If $\theta = 37.5^\circ$ and the side opposite θ has length 306, how long is the side adjacent to θ ?

In Exercises 65 - 68, let θ be the angle in standard position whose terminal side contains the given point then compute $\cos(\theta)$ and $\sin(\theta)$.

65. $P(-7, 24)$

66. $Q(3, 4)$

67. $R(5, -9)$

68. $T(-2, -11)$