Unit 6 Test Review

2023-2024

SCORE:

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Name _____ Date _____ Period _____

Part 1 – Calculators Allowed, No Unit Circle

Convert the angle given from degrees to radians. Leave as a multiple of π. Show work!

1. 48°

2. −126°

3. 24°

Convert the angle given from radians to degrees. Round to the nearest tenth of a degree. Show work!

4. $\dfrac{13\pi}{6}$

5. $\dfrac{-5\pi}{2}$

6. 2.4

Find the length of the arc intercepted by the given central angle α in a circle with radius r. Round answers to the nearest hundredth. Show work!

7. $\alpha = 2.50, \quad r = 18.15 \, cm$

8. $\alpha = 115°, \quad r = 5.1 \, in$

Find the area of a sector of a circle with the given central angle α and the given radius r of the circle. Round answers to the nearest hundredth. Show work!

9. $\alpha = 178°, \quad r = 10.2 \, ft$

10. $\alpha = 3.2, \quad r = 2 \, m$

Find the measure of two angles, one positive and one negative that are coterminal with the given angle.

11. 95°

12. −245°

13. $\dfrac{-5\pi}{6}$

14. $\dfrac{15\pi}{4}$

15. A wheel with a 16 inch diameter is turning at the rate of 75.4 radians per second. Find the linear velocity of the wheel in feet per minute. Round answer to nearest ft. /min.

Find the exact values of $\sin\alpha, \cos\alpha, \tan\alpha, \csc\alpha, \sec\alpha, and \cot\alpha$ **where** α **is an angle in standard position whose terminal side contains the given point. (Reduce and rationalize fractions if possible.)**

16. (-7, 5)   17. (4, -6)

Evaluate each expression using a calculator. Give results in degrees to the nearest tenth.

18. $\cos^{-1}\left(\dfrac{1}{8}\right)$ 19. $\sin^{-1}(.578)$ 20. $\cot^{-1}(3.173)$

Use a calculator to find the acute angle α **(to the nearest tenth of a degree) that satisfies each equation**.

21. $\sin\theta = 0.37$ 22. $\cos\alpha = 0.965$ 23. $\csc\theta = 2.01$
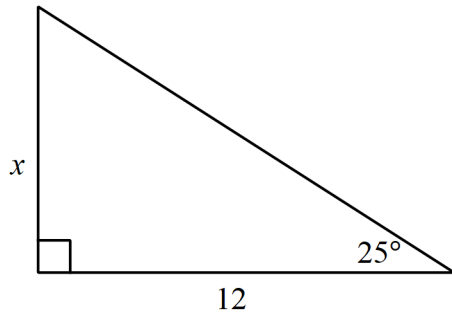
Solve each right triangle with the given sides and angles. In each case make a sketch. Round approximate answers to the nearest tenth.

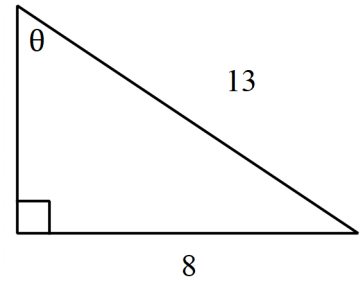24. a = 13, c = 20   25. $B = 26°, \ c = 15$

Use a proper trigonometric ratio to solve for x or θ. Round answers to the nearest tenth.

26.

27.

28. The angle of elevation from a boat on a lake to the top of a cliff is 18 degrees. If the line of sight to the top of the cliff is 184 feet, how far is the boat from the base of the cliff? Round answer to the nearest foot.

Find all angles in [0°, 360°) that satisfy each equation. Round approximations to the nearest tenth of a degree.

29. $\sin \alpha = -0.244$

30. $\cos \alpha = -0.158$

31. $\cot \alpha = -.433$

Find the exact value of the following expression without using a calculator. Some of the expressions may be undefined. Rationalize ratios if possible.

32. $\sin \pi$

33. $\cos \dfrac{\pi}{2}$

34. $\tan \dfrac{\pi}{3}$

35. $\csc \dfrac{\pi}{4}$

36. $\sec \dfrac{\pi}{6}$

37. $\cot\left(-\dfrac{\pi}{2}\right)$

38. $\sin\left(\dfrac{-2\pi}{3}\right)$

39. $\cos \dfrac{10\pi}{3}$

40. $\tan 135°$

41. $\csc 300°$

42. $\sec(-240°)$

43. $\cot 510°$

Find the angle α, in degrees between $[0°,\ 90°]$ that satisfies each equation. Do not use a calculator.

44. $\sin \alpha = \left(\dfrac{\sqrt{2}}{2}\right)$

45. $\cos \alpha = 1$

46. $\tan \alpha = 0$

47. $\csc \alpha = \dfrac{2\sqrt{3}}{3}$

48. $\sec \alpha = \dfrac{2\sqrt{3}}{3}$

49. $\tan \alpha = undefined$

50. $\cot \alpha = 1$

Evaluate each expression without using a calculator. Write answer in degrees and radians.

51. $\cos^{-1}\left(\dfrac{\sqrt{3}}{2}\right)$

52. $\sin^{-1}\left(\dfrac{\sqrt{3}}{2}\right)$

53. $\tan^{-1}(1)$

54. $\sec^{-1}(und)$

Find the exact value of the expression. Do not use a calculator.

55. $\sec \theta$, if $\sin \theta = -\frac{3}{5}$, $\cot \theta > 0$

56. $\cot \theta$, if $\sin \theta = -\frac{7}{25}$ and $\tan \theta < 0$

Find the exact value of each expression. Leave answers in terms of π when necessary.

57. $\sin^{-1}(-0.5)$

58. $\arctan(-1)$

59. $\sec^{-1}\left(\sqrt{2}\right)$

60. $\cos\left(\arcsin\left(\frac{1}{2}\right)\right)$

61. $\tan\left(\arccos\left(\frac{\sqrt{2}}{2}\right)\right)$

62. $\sin^{-1}\left(\sin\left(-\frac{\pi}{4}\right)\right)$

63. $\sin^{-1}\left(\sin\left(\frac{3\pi}{4}\right)\right)$

64. $\cos^{-1}\left(\cos\left(-\frac{\pi}{6}\right)\right)$

65. $\csc^{-1}\left(\sec\left(\frac{\pi}{3}\right)\right)$

Find the exact value of each expression in degrees.

66. $\sin^{-1}(1)$

67. $\arccos\left(-\frac{1}{\sqrt{2}}\right)$

68. $\cot^{-1}\left(\sqrt{3}\right)$

69. $\operatorname{arc}\cot(0)$

Find all real numbers in [0, 2π) that satisfy each equation.

70. $\cos(x)+1=0$

Find all angles in [0°, 360°) that satisfy each equation.

71. $2\sin(x)+1=0$

Find all real numbers in that satisfy each equation. Leave answers in terms of π.

72. $2\sin(x)-1=0$ 73. $2\tan(x)+2=0$

Find all angles in that satisfy each equation. Leave answers in degrees.

74. $2\cos(x)=\sqrt{2}$ 75. $\sqrt{3}\tan(x)-1=0$