

Day 5 Trig. given an angle and inverse

Date _____ Period _____

Use the given point on the terminal side of angle θ to find the value of all 6 trigonometric functions (ignore the trig. function stated).

1) $\cot \theta; (-17, 5)$

$$-\frac{17}{5}$$

2) $\csc \theta; (\sqrt{17}, -8)$

$$-\frac{9}{8}$$

3) $\cot \theta; (8, \sqrt{17})$

$$\frac{8\sqrt{17}}{17}$$

4) $\cot \theta; (-4, -3)$

$$\frac{4}{3}$$

5) $\cos \theta; (-\sqrt{19}, -9)$

$$-\frac{\sqrt{19}}{10}$$

6) $\sec \theta; (8, -15)$

$$\frac{17}{8}$$

7) $\cot \theta; (-8, -\sqrt{17})$

$$\frac{8\sqrt{17}}{17}$$

8) $\cot \theta; (-6, 8)$

$$-\frac{3}{4}$$

9) $\cot \theta; (-18, -19)$

$$\frac{18}{19}$$

10) $\sin \theta; (2\sqrt{3}, -2)$

$$-\frac{1}{2}$$

11) $\cos \theta; (7, 14)$

$$\frac{\sqrt{5}}{5}$$

12) $\cot \theta; (-4, 2\sqrt{5})$

$$-\frac{2\sqrt{5}}{5}$$

13) $\csc \theta; (4, -2\sqrt{5})$

$$-\frac{3\sqrt{5}}{5}$$

14) $\cos \theta; (\sqrt{13}, -6)$

$$\frac{\sqrt{13}}{7}$$

15) $\tan \theta; (-11, 5)$

$$-\frac{5}{11}$$

16) $\csc \theta; (-20, -10)$

$$-\sqrt{5}$$

17) $\csc \theta; (4, -3)$

$$-\frac{5}{3}$$

18) $\sin \theta; (-3, -4)$

$$-\frac{4}{5}$$

19) $\sec \theta; (15, 15)$

$$\sqrt{2}$$

20) $\csc \theta; (5, -\sqrt{11})$

$$-\frac{6\sqrt{11}}{11}$$

Find the exact values of the five trigonometric ratios not given.

21) $\sin \theta = \frac{20}{29}$ and $\cos \theta < 0$

$$\cos \theta = -\frac{21}{29}, \tan \theta = -\frac{20}{21}$$

$$\csc \theta = \frac{29}{20}, \sec \theta = -\frac{29}{21}, \cot \theta = -\frac{21}{20}$$

22) $\tan \theta = \frac{3}{4}$ and $\sin \theta > 0$

$$\sin \theta = \frac{3}{5}, \cos \theta = \frac{4}{5}$$

$$\csc \theta = \frac{5}{3}, \sec \theta = \frac{5}{4}, \cot \theta = \frac{4}{3}$$

23) $\csc \theta = \frac{\sqrt{6}}{2}$ and $\cos \theta > 0$

$$\sin \theta = \frac{\sqrt{6}}{3}, \cos \theta = \frac{\sqrt{3}}{3}, \tan \theta = \sqrt{2}$$

$$\sec \theta = \sqrt{3}, \cot \theta = \frac{\sqrt{2}}{2}$$

24) $\csc \theta = \frac{5}{4}$ and $\cos \theta < 0$

$$\sin \theta = \frac{4}{5}, \cos \theta = -\frac{3}{5}, \tan \theta = -\frac{4}{3}$$

$$\sec \theta = -\frac{5}{3}, \cot \theta = -\frac{3}{4}$$

25) $\cos \theta = -\frac{4}{5}$ and $\sin \theta > 0$

$$\sin \theta = \frac{3}{5}, \tan \theta = -\frac{3}{4}$$

$$\csc \theta = \frac{5}{3}, \sec \theta = -\frac{5}{4}, \cot \theta = -\frac{4}{3}$$

26) $\sin \theta = \frac{3}{5}$ and $\cos \theta < 0$

$$\cos \theta = -\frac{4}{5}, \tan \theta = -\frac{3}{4}$$

$$\csc \theta = \frac{5}{3}, \sec \theta = -\frac{5}{4}, \cot \theta = -\frac{4}{3}$$

27) $\sin \theta = -\frac{8}{17}$ and $\cos \theta < 0$

$$\cos \theta = -\frac{15}{17}, \tan \theta = \frac{8}{15}$$

$$\csc \theta = -\frac{17}{8}, \sec \theta = -\frac{17}{15}, \cot \theta = \frac{15}{8}$$

28) $\sec \theta = \frac{17}{15}$ and $\sin \theta < 0$

$$\sin \theta = -\frac{8}{17}, \cos \theta = \frac{15}{17}, \tan \theta = -\frac{8}{15}$$

$$\csc \theta = -\frac{17}{8}, \cot \theta = -\frac{15}{8}$$

29) $\sin \theta = -\frac{2\sqrt{10}}{7}$ and $\cos \theta > 0$

$$\cos \theta = \frac{3}{7}, \tan \theta = -\frac{2\sqrt{10}}{3}$$

$$\csc \theta = -\frac{7\sqrt{10}}{20}, \sec \theta = \frac{7}{3}, \cot \theta = -\frac{3\sqrt{10}}{20}$$

30) $\cos \theta = \frac{4}{5}$ and $\sin \theta < 0$

$$\sin \theta = -\frac{3}{5}, \tan \theta = -\frac{3}{4}$$

$$\csc \theta = -\frac{5}{3}, \sec \theta = \frac{5}{4}, \cot \theta = -\frac{4}{3}$$

31) $\cos \theta = -\frac{12}{13}$ and $\sin \theta < 0$

$$\sin \theta = -\frac{5}{13}, \tan \theta = \frac{5}{12}$$

$$\csc \theta = -\frac{13}{5}, \sec \theta = -\frac{13}{12}, \cot \theta = \frac{12}{5}$$

32) $\sec \theta = -\frac{5}{4}$ and $\sin \theta > 0$

$$\sin \theta = \frac{3}{5}, \cos \theta = -\frac{4}{5}, \tan \theta = -\frac{3}{4}$$

$$\csc \theta = \frac{5}{3}, \cot \theta = -\frac{4}{3}$$

33) $\sin \theta = \frac{\sqrt{2}}{2}$ and $\cos \theta < 0$

$$\cos \theta = -\frac{\sqrt{2}}{2}, \tan \theta = -1$$

$$\csc \theta = \sqrt{2}, \sec \theta = -\sqrt{2}, \cot \theta = -1$$

34) $\cos \theta = -\frac{15}{17}$ and $\sin \theta < 0$

$$\sin \theta = -\frac{8}{17}, \tan \theta = \frac{8}{15}$$

$$\csc \theta = -\frac{17}{8}, \sec \theta = -\frac{17}{15}, \cot \theta = \frac{15}{8}$$

$$35) \sec \theta = \frac{5}{4} \text{ and } \sin \theta > 0$$

$$\sin \theta = \frac{3}{5}, \cos \theta = \frac{4}{5}, \tan \theta = \frac{3}{4}$$

$$\csc \theta = \frac{5}{3}, \cot \theta = \frac{4}{3}$$

$$37) \sec \theta = \sqrt{2} \text{ and } \sin \theta > 0$$

$$\sin \theta = \frac{\sqrt{2}}{2}, \cos \theta = \frac{\sqrt{2}}{2}, \tan \theta = 1$$

$$\csc \theta = \sqrt{2}, \cot \theta = 1$$

$$39) \sec \theta = \frac{\sqrt{13}}{3} \text{ and } \sin \theta < 0$$

$$\sin \theta = -\frac{2\sqrt{13}}{13}, \cos \theta = \frac{3\sqrt{13}}{13}, \tan \theta = -\frac{2}{3}$$

$$\csc \theta = -\frac{\sqrt{13}}{2}, \cot \theta = -\frac{3}{2}$$

$$36) \cot \theta = -\frac{1}{2} \text{ and } \sin \theta < 0$$

$$\sin \theta = -\frac{2\sqrt{5}}{5}, \cos \theta = \frac{\sqrt{5}}{5}, \tan \theta = -2$$

$$\csc \theta = -\frac{\sqrt{5}}{2}, \sec \theta = \sqrt{5}$$

$$38) \sin \theta = \frac{\sqrt{3}}{2} \text{ and } \cos \theta < 0$$

$$\cos \theta = -\frac{1}{2}, \tan \theta = -\sqrt{3}$$

$$\csc \theta = \frac{2\sqrt{3}}{3}, \sec \theta = -2, \cot \theta = -\frac{\sqrt{3}}{3}$$

$$40) \cot \theta = -3 \text{ and } \sin \theta < 0$$

$$\sin \theta = -\frac{\sqrt{10}}{10}, \cos \theta = \frac{3\sqrt{10}}{10}, \tan \theta = -\frac{1}{3}$$

$$\csc \theta = -\sqrt{10}, \sec \theta = \frac{\sqrt{10}}{3}$$

Find the exact value of each expression using the unit circle for problems 41-58 over the interval 0 to 360 degrees.

$$41) \tan^{-1} 0$$

$$0$$

$$42) \cot^{-1} \frac{\sqrt{3}}{3}$$

$$\frac{\pi}{3}$$

$$43) \cos^{-1} 1$$

$$0$$

$$44) \sin^{-1} -\frac{\sqrt{2}}{2}$$

$$-\frac{\pi}{4}$$

$$45) \sin^{-1} \frac{\sqrt{2}}{2}$$

$$\frac{\pi}{4}$$

$$46) \csc^{-1} \frac{2\sqrt{3}}{3}$$

$$\frac{\pi}{3}$$

$$47) \cos^{-1} \frac{\sqrt{2}}{2}$$

$$\frac{\pi}{4}$$

$$48) \csc^{-1} 2$$

$$\frac{\pi}{6}$$

49) $\sec^{-1} \frac{2\sqrt{3}}{3}$

$$\frac{\pi}{6}$$

50) $\csc^{-1} -2$

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

51) $\sec \sin^{-1} \frac{\sqrt{65}}{9}$

$$\frac{9}{4}$$

52) $\sec \tan^{-1} (2\sqrt{2})$

$$3$$

53) $\sec \tan^{-1} \frac{\sqrt{3}}{3}$

$$\frac{2\sqrt{3}}{3}$$

54) $\tan^{-1} \left(\cot \frac{2\pi}{3} \right)$

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

55) $\cos^{-1} \left(\csc -\frac{\pi}{2} \right)$

$$\pi$$

56) $\sin^{-1} (\tan 0)$

$$0$$

57) $\cos^{-1} \left(\sin \frac{\pi}{3} \right)$

$$\frac{\pi}{6}$$

58) $\sin^{-1} \left(\cot \frac{\pi}{2} \right)$

$$0$$

59) $\sec \cos^{-1} \frac{\sqrt{5}}{10}$

$$2\sqrt{5}$$

60) $\sin \cos^{-1} \frac{4\sqrt{17}}{17}$

$$\frac{\sqrt{17}}{17}$$

Write each trigonometric expression as an algebraic expression.

61) $\sec \sin^{-1} x$

$$\frac{1}{\sqrt{1-x^2}}$$

62) $\sec \tan^{-1} x$

$$\sqrt{1+x^2}$$

63) $\csc \tan^{-1} x$

$$\frac{\sqrt{1+x^2}}{x}$$

64) $\cot \tan^{-1} x$

$$\frac{1}{x}$$