

Complete the following questions:

- 1) The radius of the unit circle is 1 and the center is at (0,0).
- 2) A positive angle measure indicates the angle opens in a counter-clockwise direction and a negative angle measure indicates the angle opens in a clockwise direction.
- 3) In an ordered pair, the x-coordinate is the cosine of the angle, and the y-coordinate is the sine of the angle.
- 4) In which quadrant(s) would the sin be negative? III, IV
- 5) In which quadrant(s) would the cos be negative? II, III
- 6) In which quadrant(s) would the tan be positive? I, III
- 7) In which quadrant(s) would the sec be negative? II, III
- 8) In which quadrant(s) would the cot be negative? II, IV

Find the reference angle

- 9) $\frac{5\pi}{3}$ $\frac{\pi}{3}$ 10) $\frac{7\pi}{6}$ $\frac{\pi}{6}$ 11) $\frac{3\pi}{4}$ $\frac{\pi}{4}$ 12) -240° 60° 13) 150° 30°
- 14) -330° 30° 15) -120° 60° 16) $\frac{23\pi}{6}$ $\frac{\pi}{6}$ 17) $\frac{15\pi}{4}$ $\frac{\pi}{4}$

Find the exact value without using a calculator

- 18) $\sin \frac{5\pi}{4} = \underline{-\frac{\sqrt{2}}{2}}$ 19) $\cos \frac{11\pi}{6} = \underline{\frac{\sqrt{3}}{2}}$ 20) $\sin \frac{16\pi}{3} = \underline{-\frac{\sqrt{3}}{2}}$ 21) $\sec(-30^\circ) = \underline{\frac{2\sqrt{3}}{3}}$ 21) $\csc 225^\circ = \underline{-\sqrt{2}}$
- 22) $\cot 315^\circ = \underline{-1}$ 23) $\tan \frac{\pi}{4} = \underline{1}$ 24) $\tan \pi = \underline{0}$ 25) $\cot \frac{4\pi}{3} = \underline{\frac{\sqrt{3}}{3}}$ 26) $\sec(-\frac{\pi}{4}) = \underline{\sqrt{2}}$
- 27) $\tan -\frac{5\pi}{4} = \underline{-1}$ 28) $\sin(-\frac{7\pi}{6}) = \underline{\frac{1}{2}}$ 29) $\cos \frac{11\pi}{6} = \underline{\frac{\sqrt{3}}{2}}$ 30) $\tan 2\pi = \underline{0}$ 31) $\tan \frac{3\pi}{4} = \underline{-1}$
- 32) $\csc = \frac{2\pi}{3} \underline{\frac{2\sqrt{3}}{3}}$ 33) $\sec(-720^\circ) = \underline{1}$ 34) $\cot(-90^\circ) = \underline{0}$ 35) $\sin 450^\circ = \underline{1}$ 36) $\cos \frac{13\pi}{6} = \underline{\frac{\sqrt{3}}{2}}$

Find the exact value (means NO DECIMALS) for the following angles

- 37) $\sin \frac{19\pi}{6} = \underline{-\frac{1}{2}}$ 38) $\tan \frac{9\pi}{4} = \underline{1}$ 39) $\cos(-\frac{4\pi}{3}) = \underline{-\frac{1}{2}}$ 40) $\csc \frac{\pi}{2} = \underline{1}$
- 41) $\sec(-\frac{17\pi}{6}) = \underline{-\frac{2\sqrt{3}}{3}}$ 42) $\cot(-\frac{23\pi}{6}) = \underline{\sqrt{3}}$ 43) $\tan \frac{14\pi}{3} = \underline{-\sqrt{3}}$ 44) $\sin(-\frac{10\pi}{3}) = \underline{\frac{\sqrt{3}}{2}}$

Find the exact value of the following when the terminal side of angle θ passes through the given point:

45) $(-3, -4)$

$$\sin \theta = -4/5$$

$$\cos \theta = -3/5$$

$$\tan \theta = 4/3$$

46) $(6, -9)$

$$\sin \theta = -\frac{\sqrt{117}}{13}$$

$$\cos \theta = \frac{2\sqrt{117}}{39}$$

$$\tan \theta = -\frac{3}{2}$$

47) $(-\sqrt{7}, -8)$

$$\sin \theta = -\frac{8\sqrt{71}}{71}$$

$$\cos \theta = \frac{\sqrt{497}}{71}$$

$$\tan \theta = \frac{8\sqrt{7}}{7}$$

Simplify.

48) $\sec x \cos x$

$$1$$

49) $\tan^2 x - \sec^2 x$

$$-1$$

50) $\frac{1 - \cos^2 x}{\sin x}$

$$\sin x$$

51) $\cot x \sec x$

$$\csc x$$

52) $\cos^2 x (\sec^2 x - 1)$

$$\sin^2 x$$

53) $\frac{\sec^2 x - 1}{\sin^2 x}$

$$\sec^2 x$$

54) $\sin x + \cot x \cos x$

$$\csc x$$

55) $\frac{\cot x}{\tan x}$

$$1$$

56) $\frac{\cos^2 t - \cos^2 t \sin^2 t}{\cos^2 t}$

$$\cos^2 t$$

Use the Pythagorean identities to find $\sin t$ for the given $\cos t$.

57) $\cos t = -0.5, \quad \pi < t < \frac{3\pi}{2}$

58) $\cos t = -\frac{2}{\sqrt{7}}, \quad \frac{\pi}{2} < t < \pi$