

Obj. 18 Unit Circle and Circular Functions
Homework Problems
SOLUTIONS

College Algebra, pg. 580: 18, 30, 54, 60, 66, 72, 84

$$\begin{aligned}
 18. \quad \sin\left(-\frac{5\pi}{6}\right) &= \sin\left(2\pi - \frac{5\pi}{6}\right) \\
 &= \sin\left(\frac{12\pi}{6} - \frac{5\pi}{6}\right) = \sin\left(\frac{7\pi}{6}\right) \\
 &= -\frac{1}{2}
 \end{aligned}$$

$$\begin{aligned}
 30. \quad \csc 1.3875 &= \frac{1}{\sin 1.3875} = 1.0170
 \end{aligned}$$

$$\begin{aligned}
 54. \quad x = -\frac{\sqrt{3}}{2}, y = -\frac{1}{2} \\
 \sin \theta = -\frac{1}{2} \quad \csc \theta = -2 \\
 \cos \theta = -\frac{\sqrt{3}}{2} \quad \sec \theta = -\frac{2}{\sqrt{3}} \\
 \tan \theta = \frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} \quad \cot \theta = \sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 60. \quad \csc s = 1.0219, s \in \left[0, \frac{\pi}{2}\right] \\
 s = \csc^{-1} 1.0219 \\
 = \sin^{-1}\left(\frac{1}{1.0219}\right) \\
 = 1.3634 \\
 \left(\frac{\pi}{2} \approx 1.5708\right)
 \end{aligned}$$

$$66. \quad \left[\frac{3\pi}{2}, 2\pi\right]; \cos s = \frac{\sqrt{3}}{2}$$

$$s = \frac{11\pi}{6}$$

$$72. \quad \omega = \frac{\pi}{4} \text{ rad/min}, t = 5 \text{ min}$$

$$\omega = \frac{\theta}{t}$$

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

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

$$84. \quad r = 24.93215 \text{ cm}, \omega = .372914 \text{ rad/sec}$$

$$\begin{aligned}
 v = r\omega \\
 = (24.93215)(.372914) \\
 = 9.29755 \text{ cm/sec}
 \end{aligned}$$