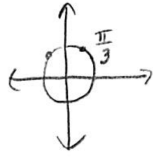


# Homework 04-17

1.  $\sqrt{3} \csc x - 2 = 0 \quad [-3\pi, \pi]$

$$\csc x = \frac{2}{\sqrt{3}}$$

$$\sin x = \frac{\sqrt{3}}{2}$$



$$x = \frac{\pi}{3} + 2\pi k, \quad k \in \mathbb{Z}$$

$$\frac{5\pi}{3} + 2\pi k, \quad k \in \mathbb{Z}$$

b)  $\left\{ -\frac{4\pi}{3}, -\frac{5\pi}{3}, \frac{\pi}{3}, \frac{2\pi}{3} \right\}$

k:  $\frac{\pi}{3}, 2\pi$

2.  $\cos^2 x - \cos x = 0 \quad [0, 4\pi]$

$$\cos x (\cos x - 1) = 0$$

$$\cos x = 0 \quad | \quad \cos x = 1$$

$$x = 2\pi k, \quad k \in \mathbb{Z}$$

$$\frac{\pi}{2} + \pi k$$



b)  $\left\{ 0, 2\pi, 4\pi, \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \frac{7\pi}{2} \right\}$

3.  $\cos 2x = \frac{1}{2} \quad \left[ -\frac{\pi}{2}, \pi \right]$



$$\left\{ \frac{\pi}{6}, \frac{5\pi}{6}, -\frac{\pi}{6} \right\}$$

$$2x = \frac{\pi}{3} + 2\pi k, \quad k \in \mathbb{Z}$$

$$\frac{5\pi}{3} + 2\pi k$$

$$x = \frac{\pi}{6} + \pi k, \quad k \in \mathbb{Z}$$

$$\frac{5\pi}{6} + \pi k$$

6.  $\cos^2 x + \frac{1}{2} \sin x - \frac{1}{2} = 0 \quad [0, 2\pi]$

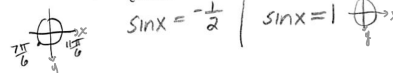
$$2\cos^2 x + \sin x - 1 = 0$$

$$2(1 - \sin^2 x) + \sin x - 1 = 0$$

$$2 - 2\sin^2 x + \sin x - 1 = 0$$

$$0 = 2\sin^2 x - \sin x - 1$$

$$0 = (2\sin x + 1)(\sin x - 1)$$



$$\sin x = -\frac{1}{2} \quad | \quad \sin x = 1$$

$$x = \frac{7\pi}{6} + 2\pi k, \quad k \in \mathbb{Z}$$

$$\frac{11\pi}{6} + 2\pi k, \quad k \in \mathbb{Z}$$

$$\frac{\pi}{2} + 2\pi k$$

b)  $\left\{ \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{\pi}{2} \right\}$