

Solve the equations for  $0 \leq x < 2\pi$

1.  $2\cos x + 1 = 0$

$$2\cos x = -1$$

$$\cos x = -\frac{1}{2}$$

$$\frac{2\pi}{3}, \frac{4\pi}{3}$$

3.  $3\csc^2 x - 4 = 0$

$$3\csc^2 x = 4$$

$$\csc^2 x = \frac{4}{3}$$

$$\frac{1}{\sin x} \csc x = \pm \frac{2}{\sqrt{3}}$$

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

$$\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$$

5.  $4\cos^2 x - 3 = 0$

$$4\cos^2 x = 3$$

$$\cos^2 x = \frac{3}{4}$$

$$\cos x = \pm \frac{\sqrt{3}}{2}$$

$$\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$$

7.  $\sec^2 x - \sec x = 2$

$$\sec^2 x - \sec x - 2 = 0$$

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

$$\frac{1}{\cos x} \sec x = 2, \quad \frac{1}{\cos x} \sec x = -1$$

$$\cos x = \frac{1}{2}, \quad \cos x = -1$$

$$\frac{\pi}{3}, \frac{5\pi}{3}, \pi$$

2.  $\sqrt{3}\sec x - 2 = 0$

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

$$\frac{1}{\cos x} \sec x = \frac{2}{\sqrt{3}}$$

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

$$\frac{\pi}{6}, \frac{11\pi}{6}$$

4.  $\csc^2 x - 2 = 0$

$$\sqrt{\csc^2 x} = \pm \sqrt{2}$$

$$\frac{1}{\sin x} \csc x = \pm \sqrt{2}$$

$$\sin x = \pm \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \pm \frac{\sqrt{2}}{2}$$

$$\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

6.  $\tan^2 x - 1 = 0$

$$\sqrt{\tan^2 x} = \pm 1$$

$$\tan x = \pm 1$$

$$\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

8.  $2\sin^2 x + 3\sin x + 1 = 0$

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

$$2\sin x = -1 \quad \sin x = -1$$

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

$$\frac{7\pi}{6}, \frac{11\pi}{6}, \frac{3\pi}{2}$$