Notes: Solving Basic Trig Equations

1) $\sqrt{2}\cdot\sin x + 1 = 0$ Solve on the interval $[0, 2\pi)$

include ↑ ↑ don't include

$-1 \quad -1$

$\frac{\sqrt{2}\sin x}{\sqrt{2}} = \frac{-1}{\sqrt{2}} \quad \frac{(\sqrt{2})}{(\sqrt{2})}$

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

$x = \frac{5\pi}{4}, \frac{7\pi}{4}$

2) $\cos x(\cos x - 1) = 0$ Solve on the interval $[0, 2\pi)$

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

$+1 \quad +1$

$\cos x = 1$

$x = \frac{\pi}{2}, \frac{3\pi}{2}, 0\pi$

3) $\csc^2 x - 2 = 0$ Solve on the inverval $[0, 2\pi)$

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

$\csc x = \pm\sqrt{2}$ *convert to sin

$\sin x = \pm\frac{1}{\sqrt{2}} \quad \frac{(\sqrt{2})}{(\sqrt{2})}$

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

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

4) $\sin x + \sqrt{3} = -\sin x$ Solve on the interval $[0, 2\pi)$

$-\sqrt{3} \quad -\sqrt{3}$

$\sin x = -\sin x - \sqrt{3}$

$+\sin x \quad +\sin x$

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

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

$x = \frac{4\pi}{3}, \frac{5\pi}{3}$

5) $3\tan^2 x - 1 = 0$ Solve on the interval $[0, 2\pi)$

$+1 \quad +1$

$\frac{3\tan^2 x}{3} = \frac{1}{3}$

$\sqrt{\tan^2 x} = \sqrt{\frac{1}{3}}$

$\tan x = \pm \frac{1}{\sqrt{3}} \quad \frac{(\sqrt{3})}{(\sqrt{3})}$

$\tan x = \pm \frac{\sqrt{3}}{3}$

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