Solving Basic Trig Equations Notes & Examples

Solve on the interval [0, 2π).

1) $\sqrt{2}\sin x + 1 = 0$

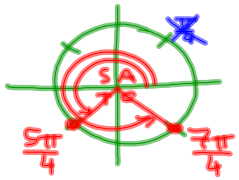
$\sqrt{2}\sin x = -1$

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

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

isolate the trig function

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



Solve on the interval [0, 2π).

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

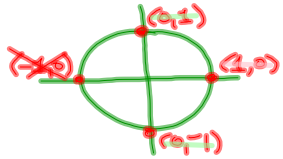
$\cos x \cdot (\cos x - 1) = 0$

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

$\cos x = 1$

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

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



Solve on the interval [0, 2π).

3) $\csc^2 x - 2 = 0$

$\csc^2 x = 2$

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

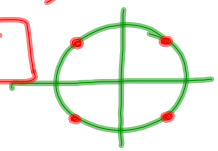
isolate csc x

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

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

reciprocal

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



Solve on the interval [0, 2π).

4) $\sin x + \sqrt{3} = -\sin x$

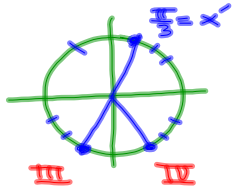
$+\sin x \quad +\sin x$

combine like terms

$2\sin x + \sqrt{3} = 0$

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

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

isolate sinx

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