March 10, 2022

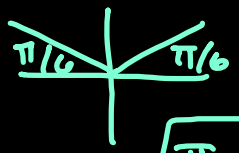
Solving Trig Equations

$2\sin^2 x + 5\sin x - 3 = 0 \quad [0, 2\pi)$

$(2\sin x - 1)(\sin x + 3) = 0$

$2\sin x - 1 = 0 \qquad \sin x + 3 = 0$

$\sin x = 1/2 \qquad \sin x = -3$ ~~$\sin x = -3$~~

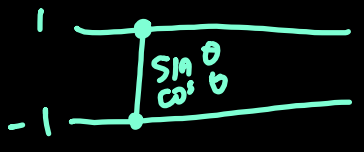


$\frac{\pi}{6}, \frac{5\pi}{6}$

Happy Birthday Lilly!

$2x^2 + 5x - 3 = 0$

$(2x - 1)(x + 3) = 0$



$\sec\theta = 2\cos\theta + 1 \qquad [0, 2\pi)$

$\cos\theta\left[\frac{1}{\cos\theta} = 2\cos\theta + 1\right]$

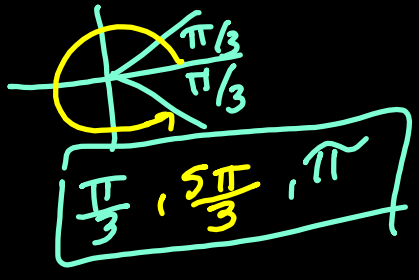
$1 = 2\cos^2\theta + \cos\theta$

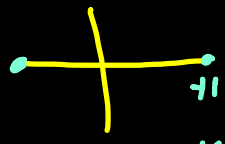
$0 = 2\cos^2\theta + \cos\theta - 1$

$0 = (2\cos\theta - 1)(\cos\theta + 1)$

$2\cos\theta - 1 = 0 \qquad \cos\theta + 1 = 0$

$\cos\theta = \frac{1}{2} \qquad \cos\theta = -1$





$\frac{\pi}{3}, \frac{5\pi}{3}, \pi$ ← check $\frac{1}{\cos\theta}$

$(-\infty, \infty)$

$\frac{\pi}{3} \pm 2\pi n$

$\frac{5\pi}{3} \pm 2\pi n$

$\pi \pm 2\pi n$

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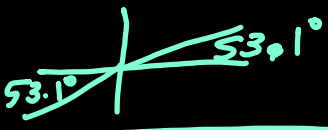
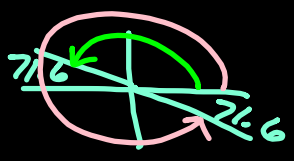
$12\cot^2\theta - 5\cot\theta - 3 = 0 \quad [0°, 360°)$

$(3\cot\theta + 1)(4\cot\theta - 3) = 0$

$\cot\theta = -\frac{1}{3} \quad \cot\theta = \frac{3}{4}$





$108.4°, 288.4°, 53.1°, 233.1°$

$\sin^2\theta + \cos\theta = 0 \quad [0°, 360°)$

$1 - \cos^2\theta + \cos\theta = 0$

6) $\sin^2\theta + \cos^2\theta = 1$

$0 = \cos^2\theta - \cos\theta - 1$

$x^2 - x - 1 = 0$

$a \quad b \quad c$

~~$0 = (\cos\theta + 1)(\cos\theta - 1)$~~

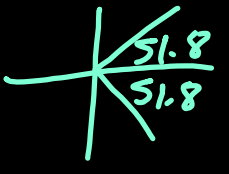
$\cos\theta = \dfrac{1 \pm \sqrt{1 + 4(1)(1)}}{2(1)}$

$\cos\theta = \dfrac{1 \pm \sqrt{5}}{2}$

~~$\cos\theta = 1.618$~~

$\cos\theta = 0.618$

$\cos^{-1}(0.618)$



$\theta = 51.8°, 308.2°$