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TRIG EQUATIONS

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

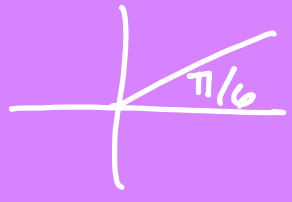
$(2\sin x - 1)(\sin x + 3) = 0$

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

$\sin x = \frac{1}{2}$ $\quad \sin x = -3$

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

$[0, 2\pi)$



Use all 4 quadrants.

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

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

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

$\frac{2}{x+3} + \frac{1}{x-1} = 5$

$x \neq -3, 1$

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

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

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

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

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

Check for excluded values

If solve from $(-\infty, \infty)$

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

$5\pi/3 \pm 2\pi n$

$\pi^3 \pm 2\pi n$

$120° \pm 360°n$

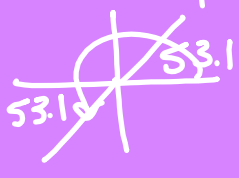
$12\cot^2\theta - 5\cot\theta - 3 = 0 \quad [0°, 360°)$

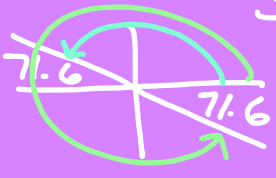
$(4\cot\theta - 3)(3\cot\theta + 1) = 0$

$4 \qquad 9$

$4\cot\theta - 3 = 0 \qquad 3\cot\theta + 1 = 0$

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





$360 - 71.6$

Check
When trig func in denom.

$\theta = 53.1°, 233.1°, 108.4°, 288.4°$

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$\sin^2\theta + \cos\theta = 0$

$[0°, 360°)$

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

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

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

$ax^2 + bx + c = 0$

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

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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

$\therefore$ I

$\cos\theta = 1.618$

$\cos\theta = -0.618$

51.8

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$\sin^{-1}(-0.25)$

$\theta = 128.2°, 231.8°$

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Hint: #16

$2\cos^2 x - \sqrt{3}\cos x = 0$

$\cos x(2\cos x - \sqrt{3}) = 0$

Pull out common factors!

$[0, 2\pi)$

$2x^2 - \sqrt{3}x = 0$

$2x^2 - 3x = 0$