

$$\cos\left(\underline{3x + \frac{\pi}{2}}\right) = -\frac{\sqrt{3}}{2}$$

$$\cos u = -\frac{\sqrt{3}}{2}$$

$$u = \frac{7\pi}{6} + 2\pi \cdot k$$

$$u = \frac{5\pi}{6} + 2\pi \cdot k$$

$k \in \mathbb{Z}$

☺

$$\underline{3x + \frac{\pi}{2}} = \frac{7\pi}{6} + 2\pi k$$

$$3x = \left(\frac{7}{6} - \frac{3}{6}\right)\pi + 2\pi k$$

$$3x = \frac{2}{3}\pi + 2\pi k$$

$$\underline{x = \frac{2}{9}\pi + \frac{2\pi}{3}k}$$

$$3x + \frac{\pi}{2} = \frac{5\pi}{6} + 2\pi k$$

$$3x = \frac{1}{3}\pi + 2\pi k$$

$$\underline{x = \frac{\pi}{9} + \frac{2\pi}{3}k}$$

$k \in \mathbb{Z}$

☺

$$\tan^2 x + \tan x = 0$$

$$\tan x (\tan x + 1) = 0 \quad x \neq \frac{\pi}{2} + k\pi$$

$k \in \mathbb{Z}$

do NOT divide by  $\tan x$

$$\tan x = 0$$

$$\underline{\underline{x = 0 + \pi k}}$$

OR  
✓

$$\tan x + 1 = 0$$

$$\tan x = -1$$

$$\underline{\underline{x = \frac{3\pi}{4} + \pi k}}$$

$$x = 0 + \pi k$$

$$x = \frac{3\pi}{4} + \pi k$$

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$\sin(a+b)$  ← ∴

$$\boxed{\sin^2 x + \cos^2 x = 1}$$

$$2 \cos^2 x - 3 = 3 \sin x$$

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

$$-2 \sin^2 x - 1 - 3 \sin x = 0$$

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

$u = \sin x$

$$2u^2 + 3u + 1 = 0$$

$$u_{1,2} = \frac{-3 \pm \sqrt{9 - 8}}{4}$$

$$u = \begin{cases} \frac{-3+1}{4} = -\frac{1}{2} \\ \frac{-3-1}{4} = -1 \end{cases}$$

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

$$\underline{\sin x = -1}$$

$$x = \frac{2\pi}{6} + 2\pi k$$

$$x = -\frac{\pi}{2} + 2\pi k$$

$$x = \frac{11\pi}{6} + 2\pi k$$

$k \in \mathbb{Z}$

$$\cos x > -\frac{\sqrt{2}}{2}$$

$$x \in [0, 2\pi)$$

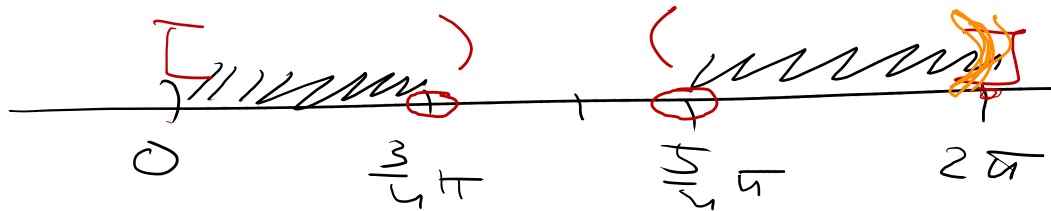
$$\cos x = -\frac{\sqrt{2}}{2}$$

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

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

$$x \in [0, \frac{3\pi}{4}) + 2\pi k$$

$$(\frac{5\pi}{4}, 2\pi] + 2\pi k$$



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

$$2 \sin^2 x > 3 \cos x$$

$$2(1 - \cos^2 x) > 3 \cos x$$

$$0 > 2 \cos^2 x + 3 \cos x - 2$$

$$t = \cos x$$

$$0 > 2t^2 + 3t - 2$$

$$0 = 2t^2 + 3t - 2$$

$$t_{1,2} = \frac{-3 \pm \sqrt{9 + 16}}{4}$$

$$t_{1,2} = \frac{-3 \pm 5}{4} = \begin{matrix} 1/2 \\ -2 \end{matrix}$$

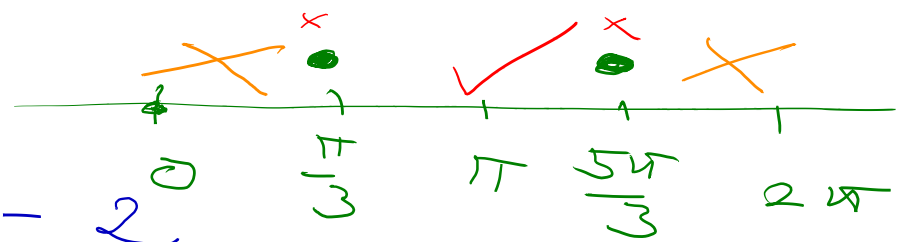
$$\cos x = +1/2$$

$$x = -\frac{\pi}{3} + 2\pi k$$

$$x = \frac{5\pi}{3} + 2\pi k$$

$$\cos x = -2$$

no sol.



$$x \in \left( \frac{\pi}{3}, \frac{5\pi}{3} \right) + 2\pi k$$