

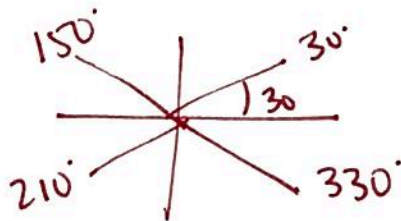
Solving Trig Equations

Solve the following trig equations on the interval $[0, 2\pi)$.

$$\textcircled{1} \quad \frac{4 \cos^2(x)}{4} = \frac{3}{4}$$

$$\sqrt{\cos^2(x)} = \pm \sqrt{\frac{3}{4}}$$

$$\cos(x) = \pm \sqrt{\frac{3}{4}} \rightarrow \pm \frac{\sqrt{3}}{2}$$



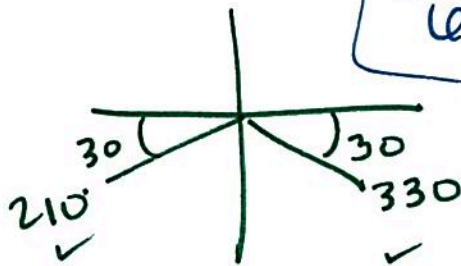
$$\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$$

$$\textcircled{2} \quad \begin{array}{r} \sin(x) - 2 = 5\sin(x) \\ -\sin(x) \quad \quad -5\sin(x) \end{array}$$

$$\frac{-2}{4} = \frac{4\sin(x)}{4}$$

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

$$x = \sin^{-1}\left(-\frac{1}{2}\right)$$



$$\frac{7\pi}{6}, \frac{11\pi}{6}$$

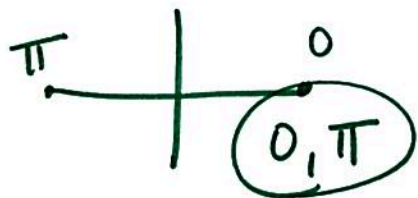
$$(3) \sin(x) \sec(x) = \sin(x)$$

$$\sin(x) \sec(x) - \sin(x) = 0$$

$$\sin(x) (\sec(x) - 1) = 0 \quad * \text{ think of solving quadratics}$$

$$\sin(x) = 0$$

$$x = \sin^{-1}(0)$$

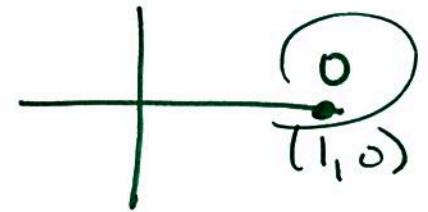


$$\sec(x) - 1 = 0$$

$$\sec(x) = 1$$

$$\sec = \frac{1}{\cos}$$

$$\boxed{0, \pi}$$



$$(4) 2 \sin^2(x) - 5 \sin(x) - 3 = 0$$

	$2 \sin^2 x$	$1 \sin x$
\sin	$2 \sin^2 x$	$1 \sin x$
-3	$-6 \sin x$	-3

$$\begin{array}{r} -6 \\ \cdot \\ + \frac{-5}{-6} \end{array}$$

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

$$\sin x - 3 = 0$$

$$\sin x = 3$$

$$x = \sin^{-1}(3)$$

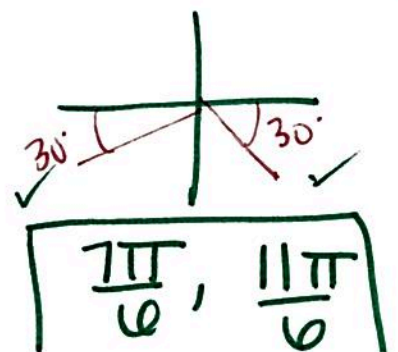
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$$2 \sin x + 1 = 0$$

$$2 \sin x = -1$$

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

$$x = \sin^{-1}\left(-\frac{1}{2}\right)$$



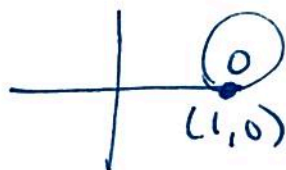
$$\textcircled{5} \quad 2 \sin^2(x) + 3 \cos(x) = 3$$

$$2(1 - \cos^2 x) + 3 \cos x = 3$$

$$2 - 2 \cos^2 x + 3 \cos x = 3 \rightarrow 2 \cos^2 x - 3 \cos x + 1 = 0$$

~~$$2 + \cos x = 3$$~~

$$\begin{aligned} \cos x - 1 &= 0 \\ \cos x &= 1 \\ x &= \cos^{-1}(1) \end{aligned}$$



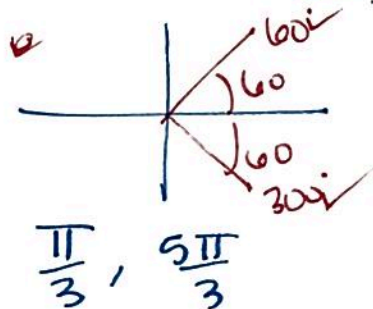
$$\boxed{0, \frac{\pi}{3}, \frac{5\pi}{3}}$$

	$2 \cos$	-1	
\cos	$2 \cos^2$	$-\cos$	$\cdot \frac{2}{-1}$
-1	$-2 \cos$	1	$+\frac{-3}{\wedge}$
			$-2 - 1$

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

$$\begin{aligned} 2 \cos x - 1 &= 0 \\ 2 \cos x &= 1 \\ \cos x &= \frac{1}{2} \end{aligned}$$

$$x = \cos^{-1}\left(\frac{1}{2}\right)$$



$$\textcircled{6} \quad \sec^2(x) - \tan(x) = 1$$

$$(1 + \tan^2 x) - \tan x = 1$$

~~$$\tan^2 x - \tan x + 1 = 1$$~~

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

$$\tan x (\tan x - 1) = 0$$

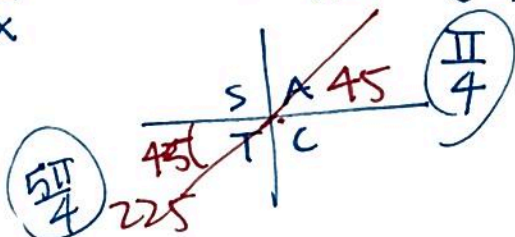
$$\tan x = 0$$

$$x = \tan^{-1}(0) \rightarrow \frac{0}{\#} \frac{y}{x}$$



$$\begin{aligned} \tan x - 1 &= 0 \\ \tan x &= 1 \end{aligned}$$

$$x = \tan^{-1}(1)$$



$$\boxed{0, \frac{\pi}{4}, \pi, \frac{5\pi}{4}}$$