

5.1 Solving Trig Equations

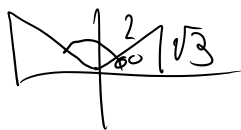
The old meets the New $[0, 2\pi)$

① $x^2 + 5x = -6$

$x^2 + 5x + 6 = 0$
 $(x+3)(x+2) = 0$

$x = -3, -2$

② $\sin x = \frac{\sqrt{3}}{2}$



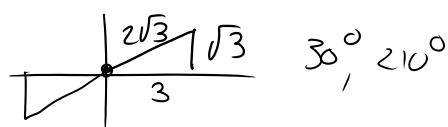
$60^\circ, 120^\circ$

$60 + 360n, 120 + 360n$

Three → th → ree → ee
 $[0, 2\pi)$

③ $\frac{3 \tan x = \sqrt{3}}{3 \quad 3}$

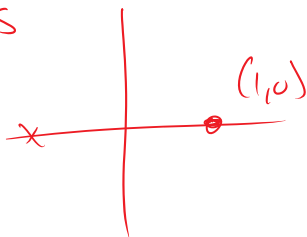
$\tan x = \frac{\sqrt{3}}{3}$



$30^\circ, 210^\circ$

④ $\sec x = 1$ All solutions

$\frac{1}{\cos}$



$0 + 360 \cdot n$

$0 + 2\pi \cdot n$

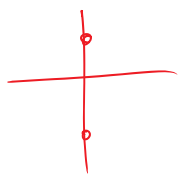
$2x^2 - x = 0$

① Solve $2 \cos x \cdot \sin x - \cos x = 0$ $[0, 2\pi)$

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

$\cos x = 0$

$2 \sin x - 1 = 0$



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

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

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



② Solve $\sqrt{\tan^2 x} = \sqrt{3}$ over $[0, 2\pi)$

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

$x = \pm \sqrt{3}$

$\tan x = \pm \sqrt{3}$



$\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

$x = 2\pi -$



$$\boxed{3, -3, -3, -3}$$

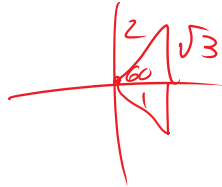
③ $4\cos^2 x - 4\cos x = -1$

$$4\cos^2 x - 4\cos x + 1 = 0$$

$$\underline{(2\cos x - 1)(2\cos x - 1) = 0}$$

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

$$\cos x = 1/2$$



All solutions

$$4x^2 - 4x = -1$$

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

$$\boxed{\frac{\pi}{3} + 2\pi \cdot n}$$

$$\boxed{\frac{5\pi}{3} + 2\pi \cdot n}$$

$$\boxed{-\frac{\pi}{3} + 2\pi n}$$

④ $\tan x \cdot \sin^2 x = \tan x$

$[0, 2\pi)$

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

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

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

$$\tan x = 0$$

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

$$\sin x = \pm 1$$

