

Solving Trig Equations

Linear & Quadratic

Solve for θ .

Ex 1)

a) $\sqrt{\sin^2 \theta} = \frac{3}{4}$ over $0 \leq \theta \leq 2\pi$

$$\sin \theta = \pm \frac{\sqrt{3}}{2}$$

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

b) $\sqrt{\sin^2 \theta} = \frac{3}{4}$ over $\frac{3\pi}{2} \leq \theta \leq 2\pi$

$$\sin \theta = \pm \frac{\sqrt{3}}{2}$$

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

S/A
T/C

Ex 2) $4\sin^2 \theta - 1 = 0$

over $0 \leq \theta \leq 2\pi$

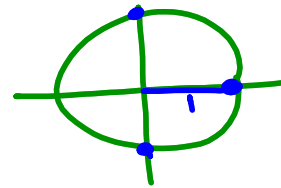
Let $\sin \theta = x$
 $4x^2 - 1 = 0$
 ~~$4x^2 = 1$~~
 $\frac{4x^2}{4} = \frac{1}{4}$
 $\sqrt{x^2} = \sqrt{\frac{1}{4}}$
 $x = \pm \frac{1}{2}$

$\sin \theta = \pm \frac{1}{2}$
 $\theta = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

Ex 3) a) $\cos^2 x - \cos x = 0$

over $[0, 2\pi]$

$\cos x (\cos x - 1) = 0$
 $\cos x = 0$ $\cos x = 1$
 $x = \frac{\pi}{2}, \frac{3\pi}{2}$ $x = 0, 2\pi$



b) $\cos^2 x - \cos x = 0$

over $(0, 2\pi]$

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

↗ not included

ex 4) $2\sin^2\theta - 5\sin\theta - 3 = 0$

general solution

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

$$\cancel{\sin\theta = 3}^{(1)} \quad \sin\theta = -\frac{1}{2}^{(1/2)}$$

$$\theta = \frac{7\pi}{6} + 2\pi k^{(1)}$$

$$\theta = \frac{11\pi}{6} + 2\pi k^{(1)} \quad k \in \mathbb{I}$$

S	A
T	C

scrap

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

$$x^2 - 5x - 6 = 0$$

$$(x - \frac{6}{2})(x + \frac{1}{2}) = 0$$

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

White WS # 2-9