

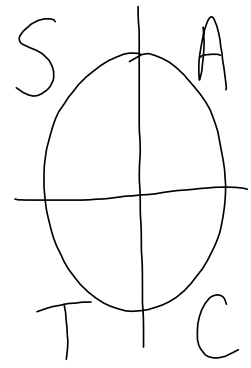
4.4 Solving Trig Equations

Solve $\cos\theta = -\frac{1}{2}$, $0 \leq \theta < 2\pi$

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

cos is neg in QII & QIII

$$\theta = \frac{2\pi}{3} \text{ \& \ } \frac{4\pi}{3}$$



Solve $\cos\theta = -\frac{1}{2}$ for all θ

$$\theta = \begin{cases} \frac{2\pi}{3} + 2\pi n, n \in \mathbb{Z} \\ \frac{4\pi}{3} + 2\pi n, n \in \mathbb{Z} \end{cases}$$

General Solution

Solve $2\cos\theta + 1 = 0$, $0 \leq \theta < 2\pi$

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

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

$$\theta = \frac{2\pi}{3} \text{ \& \ } \frac{4\pi}{3}$$

ex) Solve $3\cos\theta + 1 = 0$, $0 \leq \theta < 2\pi$ (RAD)

$$\cos\theta = -\frac{1}{3} \quad \text{QII \& QIII}$$

$$\cos^{-1}\left(-\frac{1}{3}\right) = 1.9 \text{ rads}$$

$$\& 2\pi - 1.9 = 4.4 \text{ rads}$$

$$3\cos(\text{ans}) + 1 = 0$$

$$\text{Ex) Solve } 5\sin\theta + 2 = 1 + 3\sin\theta, \theta \in [0, 2\pi)$$

$-3\sin\theta \quad -2 \quad -2 \quad -3\sin\theta$

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

$$\sin\theta = -\frac{1}{2} \quad \text{Q III \& Q IV}$$

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

Ex) Solve $3\csc x - 6 = 0, x \in [0, 360^\circ)$

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#1, 5, 6, 10-12,

15, 17, 18, C2, C3

$$\csc x = 2$$

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

$$\sin x = \frac{1}{2} \quad \text{QI \& QII}$$

$$x = 30^\circ \& 150^\circ$$