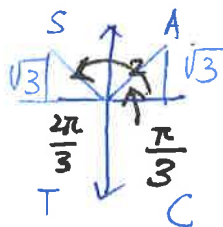


Example 1).  $\sin x = \frac{\sqrt{3}}{2}, x \in (0, 2\pi]$



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

Example 2).  $\sin 2x = \frac{\sqrt{3}}{2}, x \in (0, 2\pi]$

$$2x \in (0, 4\pi]$$

$$\sin 2x = \frac{\sqrt{3}}{2}$$

$$\rightarrow 2x = \left(\frac{\pi}{3}, \frac{2\pi}{3}\right), \frac{\pi}{3} + 2\pi = \left(\frac{7\pi}{3}\right)$$

$$\frac{2\pi}{3} + 2\pi = \left(\frac{8\pi}{3}\right)$$

Example 3)  $2\cos\left(3x - \frac{\pi}{6}\right) = -\sqrt{2}, x \in [-\pi, \pi]$

*Solution attached.*

$$x = \frac{\pi}{6}, \frac{\pi}{3}, \frac{7\pi}{6}, \frac{4\pi}{3}$$

Example 4)  $\sin^2 \theta - 3\sin \theta = 10, 0^\circ < \theta \leq 360^\circ$  Use Calculator.

$$\sin^2 \theta - 3\sin \theta - 10 = 0$$

$$(\sin \theta - 5)(\sin \theta + 2)$$

$$\sin \theta = 5 \quad \sin \theta = -2$$

No solution      No solution



$$\Rightarrow \begin{aligned} 2\sin^2 \theta + 9\sin \theta &= 5 \\ 2\sin^2 \theta + 9\sin \theta - 5 &= 0 \\ (2\sin \theta - 1)(\sin \theta + 5) &= 0 \\ \sin \theta &= \frac{1}{2} & \sin \theta &= -5 \\ \theta &= 30^\circ & \text{No solution.} \\ &= 150^\circ \end{aligned}$$

Worksheet one (Intro to Solving Equations) Do your work in separate paper.

Solve for  $0^\circ < \theta \leq 360^\circ$ , giving your answers as exact values:

1.  $2\sin^2 \theta + 3\sin \theta + 1 = 0$

2.  $4\cos^2 \theta + 4\cos \theta - 3 = 0$

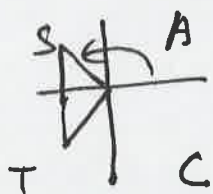
3.  $\tan^2 \theta - 3 = 0$

4.  $2\sin^2 \theta = 1$

5.  $4\cos^2 \theta + 4\cos \theta + 1 = 0$

$$3) \cos \left[ 3x - \frac{\pi}{6} \right] = -\frac{\sqrt{2}}{2}$$

$$x \in [-\pi, \pi]$$



$$3x \in [-3\pi, 3\pi]$$

$$-3x - \frac{\pi}{6} \in \left[ -\frac{19\pi}{6}, \frac{17\pi}{6} \right]$$

$$\textcircled{1} \quad 3x - \frac{\pi}{6} = \frac{3\pi}{4}, \quad -\frac{3\pi}{4}$$

$$\textcircled{1} \quad \frac{3\pi}{6} - \frac{\pi}{6} \quad \frac{3\pi}{6} - \frac{\pi}{6}$$

$$x = \left( \frac{3\pi}{4} + \frac{\pi}{6} \right) \cdot \frac{1}{3} = \left( \frac{11\pi}{12} \right) \cdot \frac{1}{3} = \left( \frac{11\pi}{36} \right)$$

9π //

$$x = \left( -\frac{3\pi}{4} + \frac{\pi}{6} \right) \cdot \frac{1}{3} = \left( \frac{-7\pi}{36} \right)$$

$$\textcircled{2} \quad 3x - \frac{\pi}{6} = \frac{11\pi}{4}, \quad -\frac{11\pi}{4}$$

$$x = \left( \frac{11\pi}{4} + \frac{\pi}{6} \right) \cdot \frac{1}{3} = \left( \frac{35\pi}{36} \right)$$

33π + 2π

$$x = \left( -\frac{11\pi}{4} + \frac{\pi}{6} \right) \cdot \frac{1}{3} = \left( \frac{-31\pi}{36} \right)$$

$$\textcircled{3} \quad 3x - \frac{\pi}{6} = -\frac{5\pi}{4}, \quad \frac{5\pi}{4}$$

$$x = \left( -\frac{5\pi}{4} + \frac{\pi}{6} \right) \cdot \frac{1}{3} = \left( \frac{-13\pi}{36} \right)$$

-15π + 2π  
12

$$x = \left( \frac{5\pi}{4} + \frac{\pi}{6} \right) \cdot \frac{1}{3} = \left( \frac{17\pi}{36} \right)$$

15π + 2π  
12