

Advanced Math

5-3

(Day 1)

Solving Trigonometric Equations

Solve.

11) $2 \cos x + 1 = 0$

$$2 \cos x = -1$$

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

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

$$\left\{ \begin{array}{l} \frac{2\pi}{3} + 2\pi n, n \in \mathbb{Z} \\ \frac{4\pi}{3} + 2\pi n, n \in \mathbb{Z} \end{array} \right\}$$

17) $2 \sin^2(2x) = 1$

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

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

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

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

$$\frac{2x}{2} = \frac{\pi}{4} + \frac{\pi}{2}n, n \in \mathbb{Z}$$

$$\left\{ \frac{\pi}{8} + \frac{\pi}{4}n, n \in \mathbb{Z} \right\}$$



Find all solutions of the equation in the interval $[0, 2\pi)$.

$$25) \cos^3 x = \cos x$$

$$\cos^3 x - \cos x = 0$$

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

$$\cos x = 0 \text{ or } \sqrt{\cos^2 x} = 1$$

$$x = \cos^{-1}(0) \quad |\cos x| = 1$$

$$\frac{\pi}{2} + \pi n, n \in \mathbb{Z} \quad \cos x = \pm 1$$

$$x = \cos^{-1}(\pm 1)$$

$$\left\{0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}\right\} \quad 0 + \pi n, n \in \mathbb{Z}$$

Assignment:

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18-60 even.