

Answer on Question #59341 – Math – Trigonometry

Question

Solve $\sin(x) (\sin x + 1) = 0$,

$$x = \pm\pi n, x = \frac{\pi}{2} \pm 2\pi n$$

$$x = \pm\pi n$$

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

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

Solution

$$\sin(x)(\sin x + 1) = 0$$

$$\begin{cases} \sin x = 0, \\ \sin x + 1 = 0, \end{cases}$$

$$\begin{cases} \sin x = 0, \\ \sin x = -1, \end{cases}$$

$$\begin{cases} x = \pm\pi n, \\ x = \frac{3\pi}{2} \pm 2\pi n, \end{cases}$$

n is integer.

Answer: $x = \pm\pi n, x = \frac{3\pi}{2} \pm 2\pi n$.

Question

Solve on the interval $[0, 2\pi)$:

$$1 + \cos \theta = \frac{\sqrt{3} + 2}{2}$$

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

$$\frac{\pi}{6}, \frac{11\pi}{6}$$

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

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

Solution

$$1 + \cos(\theta) = \frac{\sqrt{3}+2}{2}, \quad 0 < \theta < 2\pi,$$

$$1 + \cos(\theta) = \frac{\sqrt{3}}{2} + 1, \quad 0 < \theta < 2\pi,$$

$$\cos(\theta) = \frac{\sqrt{3}}{2}, \quad 0 < \theta < 2\pi.$$

$$\theta = \frac{\pi}{6} \text{ or } \theta = \frac{11\pi}{6}.$$

Answer: $\frac{\pi}{6}, \frac{11\pi}{6}$.

Question

Solve on the interval $[0, 2\pi)$

$$2\sec(x) + 4 = 0$$

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

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

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

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

Solution

$$2 \sec(x) + 4 = 0, 0 < x < 2\pi,$$

$$\sec(x) + 2 = 0, 0 < x < 2\pi,$$

$$\frac{1}{\cos(x)} + 2 = 0, 0 < x < 2\pi,$$

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

$$x = \frac{2\pi}{3} \text{ or } x = \frac{4\pi}{3}.$$

$$\text{Answer: } \frac{2\pi}{3}, \frac{4\pi}{3}.$$