

14.4 pg. 935 #3-35 odd

$$\begin{aligned} 3.) \quad & 2 + 3\cos(4\pi - 5) \\ & = 2 + 3(1) - 5 \\ & = 0 \end{aligned}$$

$$\begin{aligned} 5.) \quad & 12\sin^2\left(\frac{\pi}{6}\right) - 3 \\ & = 12\left(\frac{1}{2}\right)^2 - 3 \\ & = 0 \end{aligned}$$

$$\begin{aligned} 7.) \quad & 2\cos^4\left(\frac{\pi}{2}\right) - \cos^2\left(\frac{\pi}{2}\right) \\ & = 2(0)^4 - (0)^2 \\ & = 0 \end{aligned}$$

$$\begin{aligned} 9.) \quad & 2\sin x = 1 \quad 0 \leq x \leq 2\pi \\ & \sin x = \frac{1}{2} \\ & x = \sin^{-1}\left(\frac{1}{2}\right) \\ & x = \frac{\pi}{6} \quad \text{OR} \quad \pi - \frac{\pi}{6} = \frac{5\pi}{6} \\ & \boxed{\frac{\pi}{6} + 2n\pi \quad \text{OR} \quad \frac{5\pi}{6} + 2n\pi} \end{aligned}$$

$$\begin{aligned} 11.) \quad & 3\tan x = \sqrt{3} \quad 0 \leq x \leq \pi \\ & \tan x = \frac{\sqrt{3}}{3} \\ & x = \frac{\pi}{6} \\ & \boxed{\frac{\pi}{6} + n\pi} \end{aligned}$$

$$\begin{aligned} 13.) \quad & 4\cos^2 x = 3 \\ & \cos^2 x = \frac{3}{4} \\ & \cos x = \pm \frac{\sqrt{3}}{2} \\ & x = \frac{\pi}{6} \quad \text{OR} \quad x = \frac{5\pi}{6} \end{aligned}$$

$$\boxed{\frac{\pi}{6} + n\pi \quad \text{OR} \quad \frac{5\pi}{6} + n\pi}$$

$$\begin{aligned} 15.) \quad & 2\sin x = 1 \\ & \sin x = \frac{1}{2} \\ & x = \frac{\pi}{6} \end{aligned}$$

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$$\begin{aligned} 17.) \quad & \tan x = \frac{\sqrt{3}}{3} \\ & \boxed{x = \frac{\pi}{6}, \frac{7\pi}{6}} \end{aligned}$$

$$\begin{aligned} 21.) \quad & \cos^2 x = \frac{1}{4} \\ & \cos x = \pm \frac{1}{2} \\ & \boxed{x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}} \end{aligned}$$

23) neg ÷ neg = pos.

$$\begin{aligned} \cos x &= \frac{1}{2} \\ x &= \frac{\pi}{3}, \frac{5\pi}{3} \end{aligned}$$

$$\begin{aligned} 19.) \quad & \sin^2 x = \frac{1}{2} \\ & \sin x = \pm \frac{\sqrt{2}}{2} \\ & \boxed{x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}} \end{aligned}$$

$$25.) \quad \cos x (\sqrt{3}\tan x - 1) = 0$$

$$\begin{aligned} \cos x = 0 & \left. \begin{array}{l} \sqrt{3}\tan x - 1 = 0 \\ \tan x = \frac{\sqrt{3}}{3} \\ \frac{\pi}{6} \checkmark \end{array} \right\} \\ x = \frac{\pi}{2} & \text{doesn't work!} \end{aligned}$$

$$\boxed{\frac{\pi}{6} + n\pi}$$

$$27.) 2x^4 - x^2 - 15 = 0$$

$$x^4 - x^2 - 30 = 0$$

$$(x^2 - \frac{6}{2})(x^2 + \frac{5}{2}) = 0$$

$$(x^2 - 3)(2x^2 + 5) = 0$$

$$\tan^2 x - 3 = 0 \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} 2\tan^2 x + 5 = 0$$

$$\tan^2 x = 3$$

$$\tan x = \pm\sqrt{3}$$

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

$$\tan^2 x = -\frac{5}{2}$$

not possible!

$$\boxed{\frac{\pi}{3} + n\pi \text{ OR } \frac{2\pi}{3} + n\pi}$$

$$31.) \sqrt{3}\cos^2 x = \cos^2 x \tan x$$

$$\sqrt{3} = \tan x \text{ OR } \cos^2 x = 0$$

$$\boxed{x = \frac{\pi}{3} \quad x = \frac{\pi}{2}}$$

$$35.) \cos x + \sin x \cdot \frac{\sin x}{\cos x} = 2$$

$$\cos x + \frac{\sin^2 x}{\cos x} = 2$$

$$\frac{\cos^2 x + \sin^2 x}{\cos x} = 2$$

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

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

~~cos x = 1/2~~

$$x = \frac{\pi}{3} \text{ but } \pi \leq x < 2\pi$$

$$\boxed{\text{SO } x = \frac{5\pi}{3}}$$

$$29.) (1 + \cos x)^2 = (\sqrt{3}\sin x)^2$$

$$1 + 2\cos x + \cos^2 x = 3\sin^2 x$$

$$1 + 2\cos x + \cos^2 x = 3 - 3\cos^2 x$$

$$-3 \quad +3\cos^2 x \quad -3 \quad +3\cos^2 x$$

$$4\cos^2 x + 2\cos x - 2 = 0$$

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

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

$$2x^2 + x - 1$$

$$x^2 + x - 2$$

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

$$(x + 1)(2x - 1)$$

$$\cos x + 1 = 0 \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} 2\cos x - 1 = 0$$

$$\cos x = -1 \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \cos x = \frac{1}{2}$$

$$x = \pi \checkmark \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} x = \frac{\pi}{3} \checkmark$$

$$\boxed{\pi + 2n\pi \text{ OR } \frac{\pi}{3} + 2n\pi}$$

$$33.) \sin x = \frac{-5 \pm \sqrt{33}}{2}$$

$$\sin x \approx 0.54, -5.54$$

$$x \approx 0.57, \emptyset$$

$$\boxed{x \approx 0.57}$$

$$37.) \cos^2 x = 2\cos x - 1$$

$$\cos^2 x - 2\cos x + 1 = 0$$

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

$$\boxed{(0, 1)}$$

$$\cos x = 1$$

$$\text{OR } x = 0$$