

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

$$\cos x + 1 = 1/2$$

$$\cos x = -1/2$$

$$\left\{ \begin{array}{l} x_1 = 2\pi/3 \\ x_2 = 4\pi/3 \end{array} \right\}$$

$$2) 4 \tan x + 2 = 2 \tan x$$

$$2 \tan x = -2$$

$$\tan x = -1$$

$$\left\{ \begin{array}{l} x_1 = 3\pi/4 \\ x_2 = 7\pi/4 \end{array} \right\}$$

$$3) 2 \cos x + 3 = 0$$

$$2 \cos x = -3$$

$$\cos x = -3/2$$

$$\left\{ \begin{array}{l} x = \text{no sol'n} \\ (-1 \leq \cos x \leq 1) \end{array} \right\}$$

$$4) 3(\cos x - 1) = 3 - 4 \cos x$$

$$3 \cos x - 3 = 3 - 4 \cos x$$

$$+4 \cos x \quad +3$$

$$7 \cos x = 6$$

$$\cos x = 6/7$$

$$x = \cos^{-1}(6/7)$$

$$\left\{ \begin{array}{l} x_1 = 31^\circ \\ x_2 = (360 - 31) = 329^\circ \end{array} \right\}$$

$$5) 4 \sin^2 x - 1 = 0$$

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

$$2 \sin x + 1 = 0 \quad 2 \sin x - 1 = 0$$

$$\sin x = -1/2 \quad \sin x = 1/2$$

$$\left\{ x = \pi/6, 5\pi/6, 7\pi/6, 11\pi/6 \right\}$$

$$6) 5 \sin^2 x - 4 \sin x - 1 = 0$$

$$(5 \sin x + 1)(\sin x - 1) = 0$$

$$5 \sin x + 1 = 0 \quad \sin x = 1$$

$$\sin x = -1/5 \quad x = 90^\circ$$

$$x = -11.53^\circ$$

$$\left\{ \begin{array}{l} x_1 = 180 + 11.54 = 191.54^\circ \\ x_2 = 360 - 11.54 = 348.46^\circ \\ x_3 = 90^\circ \end{array} \right\}$$

$$7) 2 \cos^2 \theta - 4 \cos \theta - 5 = 0$$

$$\cos \theta = \frac{4 \pm \sqrt{16 - 4(2)(-5)}}{2(2)}$$

$$\cos \theta = \frac{4 \pm \sqrt{56}}{4} = \frac{4 \pm 2\sqrt{14}}{4} = 1 \pm \frac{1}{2}\sqrt{14}$$

$$\cos \theta = 2.87, -0.87$$

DQ

$$\theta = \cos^{-1}(-0.87)$$

$$\left\{ \begin{array}{l} \theta_1 = 150.46^\circ \\ \theta_2 = 360 - 150.46^\circ = 209.54^\circ \end{array} \right\}$$

$$8) 4 \cos x + 3 = \frac{2}{\cos x}$$

$$4 \cos^2 x + 3 \cos x = 2$$

$$4 \cos^2 x + 3 \cos x - 2 = 0$$

$$\cos x = \frac{-3 \pm \sqrt{9 - 4(4)(-2)}}{2(4)}$$

$$\cos x = \frac{-3 \pm \sqrt{41}}{8}$$

$$\cos x_1 = 0.42539$$

$$\cos x_2 = -1.175 \quad \text{D.Q.}$$

$$x_{16} = 64.82^\circ$$

$$x_{16} = 295.18^\circ$$

4, 7018

$$9) 3 \cos 2\theta = 2 - \sin \theta$$

$$3(1 - 2\sin^2 \theta) = 2 - \sin \theta$$

$$3 - 6\sin^2 \theta = 2 - \sin \theta$$

$$0 = 6\sin^2 \theta - \sin \theta - 1$$

$$0 = (3\sin \theta + 1)(2\sin \theta - 1)$$

$$3\sin \theta + 1 = 0 \quad \left\{ \quad \right. \quad 2\sin \theta - 1 = 0$$

$$\sin \theta = -\frac{1}{3} \quad \left\{ \quad \right. \quad \sin \theta = \frac{1}{2}$$

$$\theta = -19.4712^\circ \quad \left\{ \quad \right. \quad \theta = 30^\circ, 150^\circ$$

$$\theta = 199.47^\circ, 340.53^\circ$$

$$10) 2 \cot x - \frac{4}{\cot x} = 7$$

$$2 \cot^2 x - 4 = 7 \cot x$$

$$2 \cot^2 x - 7 \cot x - 4 = 0$$

$$(2 \cot x + 1)(\cot x - 4) = 0$$

$$2 \cot x + 1 = 0 \quad \left\{ \quad \right. \quad \cot x - 4 = 0$$

$$\cot x = -\frac{1}{2} \quad \left\{ \quad \right. \quad \cot x = 4$$

$$x = -63.43^\circ \quad \left\{ \quad \right. \quad \tan x = \frac{1}{4}$$

x
Degrees

$$x_1 = 296.57 \quad x_1 = 14.04$$

$$x_2 = 116.57 \quad x_2 = 194.04$$

$$x = -1.107 \quad x = 0.245$$

tan

Radians

$$x_1 = 5.176 \quad x_1 = 0.245$$

$$x_2 = 2.035 \quad x_2 = 3.387$$

$$\frac{13\pi}{20}, \frac{33\pi}{20}, \frac{7\pi}{90}, \frac{91\pi}{90}$$