

1)

$$\cos(2x + 15) = 0.3$$

$$2x + 15 = \cos^{-1}(0.3)$$

$$= 72.5, 287.5$$

$$\uparrow$$

$$(360 - 72.5)$$

$$x = \underline{\underline{28.8^\circ}}, \underline{\underline{136.2^\circ}}$$

2)

$$\sin(3\theta - 15) = 0.7$$

$$3\theta - 15 = \sin^{-1}(0.7)$$

$$= 44.4, 135.6, 404.4$$

$$\uparrow$$

$$(180 - \text{Ans}), 495.6$$

$$\theta = \underline{\underline{19.8^\circ}}, \underline{\underline{50.2^\circ}}$$

$$\underline{\underline{139.8}}, \underline{\underline{170.2}}$$

3)

$$\tan(\theta + 30) = -2.5$$

$$\theta + 30 = \tan^{-1}(-2.5)$$

$$= -68.2, 111.8$$

$$\uparrow$$

$$(\text{Ans} + 180)$$

$$\theta = \underline{\underline{-98.2^\circ}}, \underline{\underline{81.8^\circ}}$$

4)

$$5 \cos(x - 40) = 2$$

$$\cos(x - 40) = 0.4$$

$$x - 40 = \cos^{-1}(0.4)$$

$$= 66.4, 293.6$$

$$x = \underline{\underline{106.42^\circ}}, \underline{\underline{333.58^\circ}}$$

5

$$\tan^2 x = 3$$

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

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

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

$$x = \tan^{-1}(\sqrt{3})$$

$$x = \tan^{-1}(-\sqrt{3})$$

$$x = \underline{60}, \underline{240}$$

$$x = -60, \underline{120}, \underline{300}$$

$$x = \underline{60^\circ}, \underline{120^\circ}, \underline{240^\circ}, \underline{300^\circ}$$

$$6a) \quad 2 \sin^2 x = 7 \cos x + 5$$

$$2(1 - \cos^2 x) = 7 \cos x + 5$$

$$2 - 2 \cos^2 x = 7 \cos x + 5$$

$$0 = 2 \cos^2 x + 7 \cos x + 3$$

$$b) \quad (2 \cos x + 1)(\cos x + 3) = 0$$

$$\cos x = -\frac{1}{2} \quad \cos x = -3$$

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

$$= \underline{\underline{120^\circ}}, \underline{\underline{240^\circ}} \quad \times \quad (\text{No solutions})$$

$$x = \underline{\underline{120^\circ}}, \underline{\underline{240^\circ}}$$

$$7a) \quad 6 \cos^2 x = 4 - \sin x$$

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

$$6 - 6 \sin^2 x = 4 - \sin x$$

$$0 = 6 \sin^2 x - \sin x - 2$$

$$b) \quad (3 \sin x - 2)(2 \sin x + 1) = 0$$

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

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

$$x = \sin^{-1}(2/3)$$

$$x = \sin^{-1}(-1/2)$$

$$x = \underline{41.8^\circ}, \underline{138.2^\circ}$$

$$x = -30^\circ, \underline{210^\circ}, \underline{330^\circ}$$

$$x = \underline{41.8^\circ}, \underline{138.2^\circ}, \underline{210^\circ}, \underline{330^\circ}$$

$$8) \quad 2 \cos^2 x - 3 \sin^2 x = 14 \cos x$$

$$2 \cos^2 x - 3(1 - \cos^2 x) = 14 \cos x$$

$$2 \cos^2 x - 3 + 3 \cos^2 x = 14 \cos x$$

$$5 \cos^2 x - 14 \cos x - 3 = 0$$

$$(5 \cos x + 1)(\cos x - 3) = 0$$

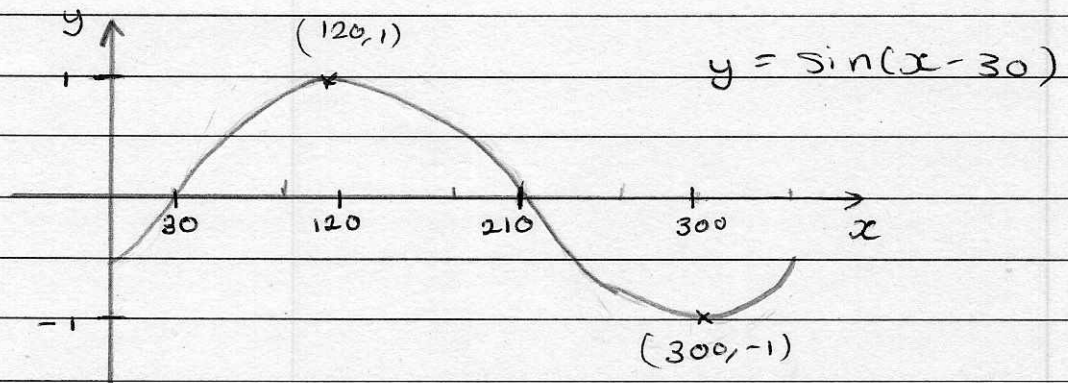
$$\cos x = -\frac{1}{5} \quad \cos x = 3$$

X

$$x = \cos^{-1}\left(-\frac{1}{5}\right)$$

$$= \underline{\underline{101.5^\circ}}, \underline{\underline{258.5^\circ}}$$

9a/



b/

$$\sin(x - 30) = 0.3$$

$$x - 30 = \sin^{-1}(0.3)$$

$$= 17.5, 162.5$$

$$x = \underline{\underline{47.5^\circ}}, \underline{\underline{192.5^\circ}}$$

10

$$3 \tan x = 4 \sin x$$

$$3 \frac{\sin x}{\cos x} = 4 \sin x$$

$$3 \sin x = 4 \sin x \cos x$$

$$0 = 4 \sin x \cos x - 3 \sin x$$

$$0 = \sin x (4 \cos x - 3)$$

$$\sin x = 0 \quad \cos x = \frac{3}{4}$$

$$x = \sin^{-1}(0) \quad x = \cos^{-1}\left(\frac{3}{4}\right)$$

$$x = \underline{0^\circ}, \underline{180^\circ} \quad x = \underline{41.4^\circ}, \underline{318.6^\circ}$$

$$x = \underline{0^\circ}, \underline{41.4^\circ}, \underline{180^\circ}, \underline{318.6^\circ}$$

11a)

$$3 \sin 2x \tan 2x = \cos 2x + 2$$

$$3 \sin 2x \cdot \frac{\sin 2x}{\cos 2x} = \cos 2x + 2$$

$$\frac{3 \sin^2 2x}{\cos 2x} = \cos 2x + 2$$

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

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

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

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

b)

$$a = 4 \quad b = 2 \quad c = -3$$

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

$$\cos 2x = 0.651 \quad \cos 2x = -1.15 \dots$$

$$2x = 49.4^\circ, 310.6^\circ \quad X$$

$$x = \underline{\underline{24.6^\circ}}, \underline{\underline{155.3^\circ}}$$