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

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

$= 72.5, 287.5$

$(360 - 72.5)$

$x = 28.8^\circ, 136.2^\circ$

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

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

$= 44.4, 135.6, 404.4, 495.6$

$(180 - \text{Ans})$

$\theta = 19.81^\circ, 50.19^\circ$

$139.81^\circ, 170.19^\circ$

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

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

$= -68.2, 111.8$

$(\text{Ans} + 180)$

$\theta = -98.2^\circ, 81.8^\circ$

4) $5\cos(x - 40) = 2$

$\cos(x - 40) = 0.4$

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

$= 66.4, 293.6$

$x = 106.42^\circ, 333.58^\circ$

5 $\tan^2 x = 3$

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

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

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

$x = 60, 240$ $\qquad$ $x = -60, 120, 300$

$x = 60^\circ, 120^\circ, 240^\circ, 300^\circ$

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

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

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

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

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

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

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

$= \underline{\underline{120°, 240°}}$ X (No solutions)

$x = \underline{\underline{120°}}, \underline{\underline{240°}}$

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

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

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

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

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

$\sin x = \frac{2}{3}$ $\sin x = -\frac{1}{2}$

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

$x = 41.8^\circ, 138.2^\circ$ $x = -30, 210^\circ, 330^\circ$

$x = 41.8^\circ, 138.2^\circ, 210^\circ, 330^\circ$

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

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

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

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

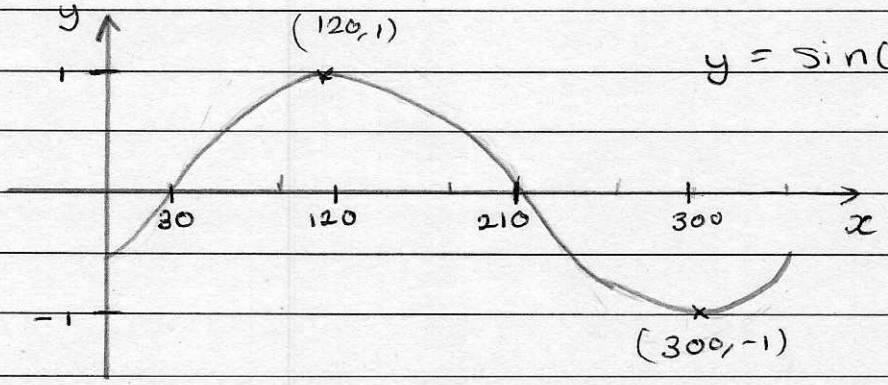
$(5\cos x + 1)(\cos x - 3) = 0$

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

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

$= 101.5°, 258.5°$

9a)



$y = \sin(x - 30)$

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

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

$= 17.5, \ 162.5$

$x = 47.5^\circ, \ 192.5^\circ$

10 $3 \tan x = 4 \sin x$

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

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

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

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

$\sin x = 0 \qquad \cos x = 3/4$

$x = \sin^{-1}(0) \qquad x = \cos^{-1}(3/4)$

$x = 0^\circ, 180^\circ \qquad x = 41.4^\circ, 318.6^\circ$

$x = 0^\circ, 41.4^\circ, 180^\circ, 318.6^\circ$

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

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

$\cos 2x = 0.651$ $\qquad$ $\cos 2x = -1.15\ldots$

$2x = 49.4°, 310.6°$ $\qquad$ ✗

$x = 24.68°, 155.32°$