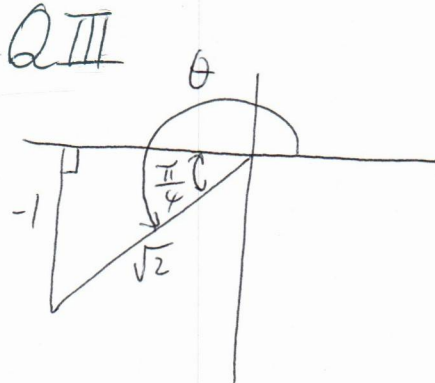


section 9.5

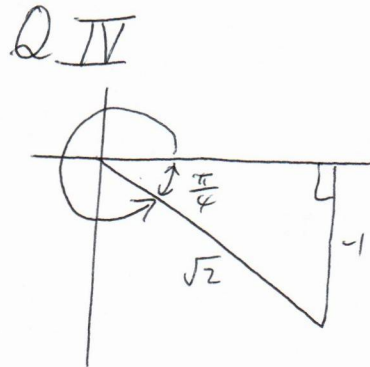
9.5L1

4) $2 \sin \theta = -\sqrt{2}$

$$\sin \theta = \frac{-\sqrt{2}}{2} = -\frac{1}{\sqrt{2}}$$



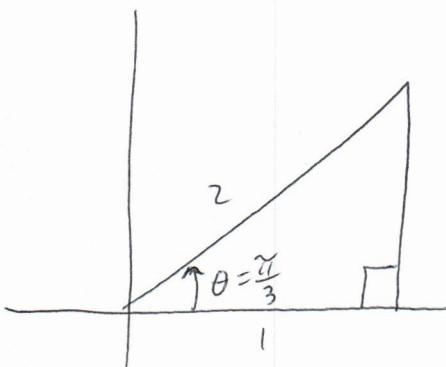
$$\theta = \pi + \frac{\pi}{4} = \underline{\underline{\frac{5\pi}{4}}}$$



$$\theta = 2\pi - \frac{\pi}{4} = \underline{\underline{\frac{7\pi}{4}}}$$

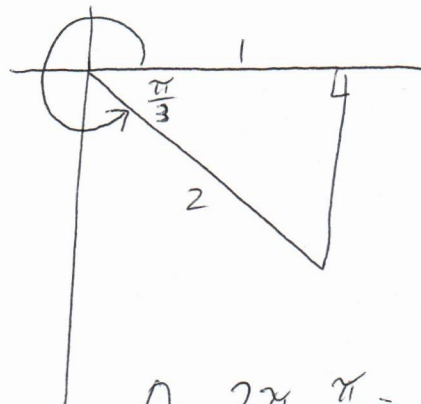
6) $2 \cos \theta = 1 \rightarrow \cos \theta = \frac{1}{2}$

Q I



$$\theta = \underline{\underline{\frac{\pi}{3}}}$$

Q IV

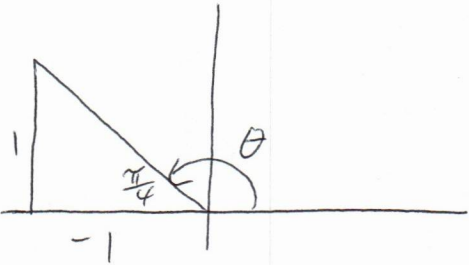


$$\theta = 2\pi - \frac{\pi}{3} = \underline{\underline{\frac{5\pi}{3}}}$$

$$8) \tan \theta = -1 \rightarrow \tan \theta = \frac{-1}{1}$$

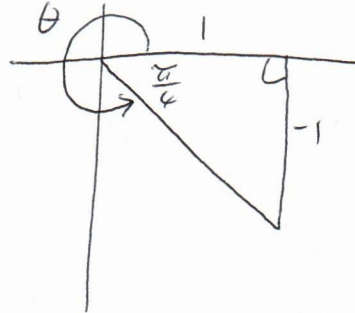
9.5L2

Q II



$$\theta = \pi - \frac{\pi}{4} = \underline{\underline{\frac{3\pi}{4}}}$$

Q IV

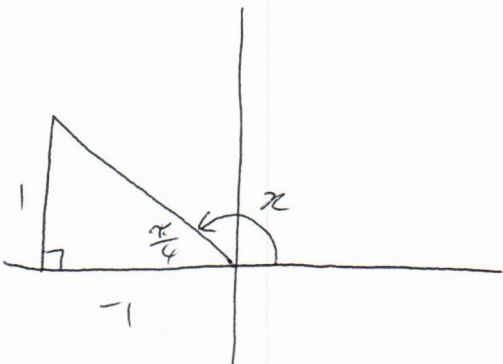


$$\theta = 2\pi - \frac{\pi}{4} = \underline{\underline{\frac{7\pi}{4}}}$$

$$10) \cot x + 1 = 0$$

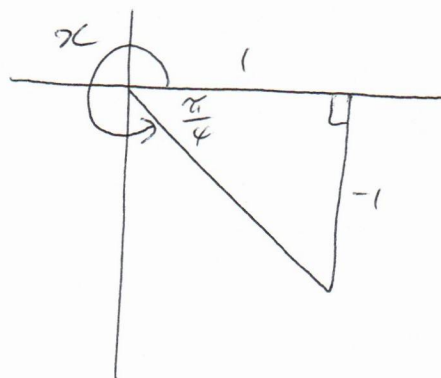
$$\cot x = -1 \rightarrow \tan x = \frac{1}{\cot x} = \frac{1}{-1}$$

Q II



$$x = \pi - \frac{\pi}{4} = \underline{\underline{\frac{3\pi}{4}}}$$

Q IV



$$x = 2\pi - \frac{\pi}{4} = \underline{\underline{\frac{7\pi}{4}}}$$

$$12) \csc^2 x - 4 = 0$$

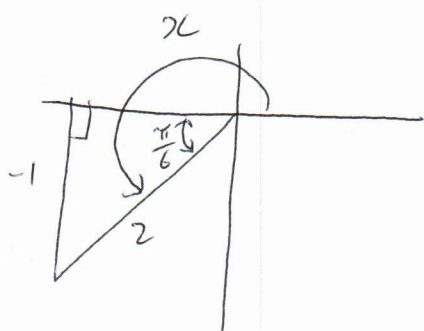
$$(\csc x + 2)(\csc x - 2) = 0$$

$$\csc x + 2 = 0$$

$$\csc x = -2$$

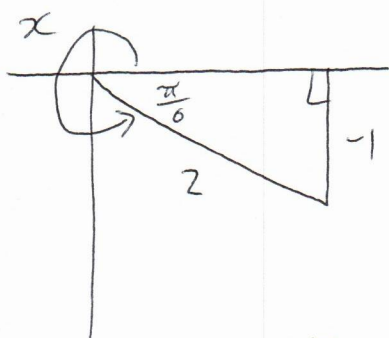
$$\sin x = \frac{1}{\csc x} = \frac{1}{-2} = -\frac{1}{2}$$

Q III



$$x = \pi + \frac{\pi}{6} = \frac{7\pi}{6}$$

Q IV



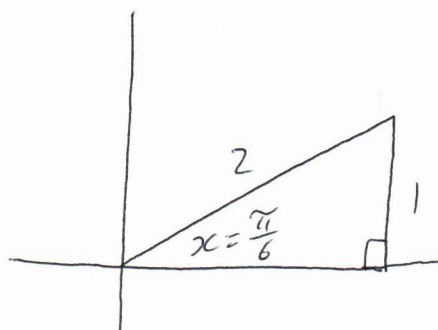
$$x = 2\pi - \frac{\pi}{6} = \frac{11\pi}{6}$$

$$\csc x - 2 = 0$$

$$\csc x = 2$$

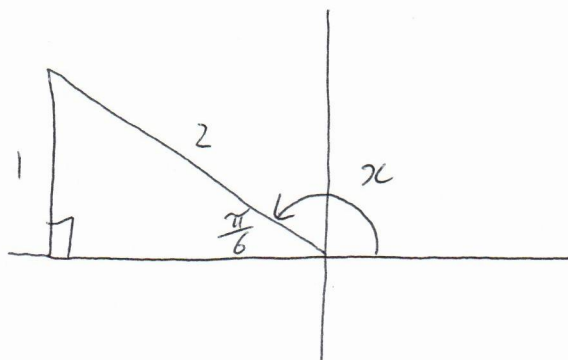
$$\sin x = \frac{1}{\csc x} = \frac{1}{2}$$

Q I



$$x = \frac{\pi}{6}$$

Q II

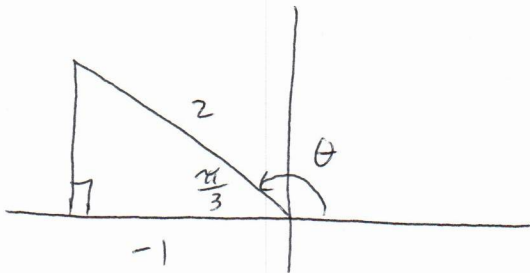


$$x = \pi - \frac{\pi}{6} = \frac{5\pi}{6}$$

$$14) 2 \cos \theta = -1 \rightarrow \cos \theta = -\frac{1}{2}$$

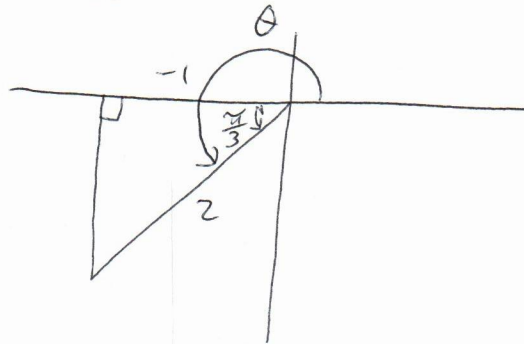
9.5/4

Q II



$$\theta = \pi - \frac{\pi}{3} = \underline{\underline{\frac{2\pi}{3}}}$$

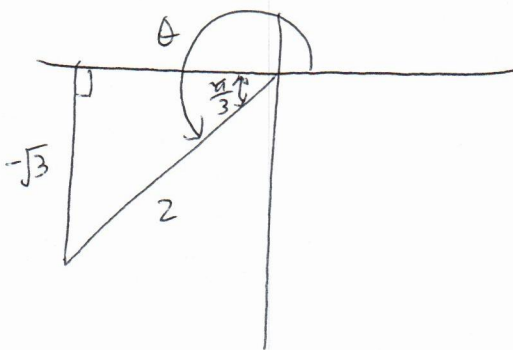
Q III



$$\theta = \pi + \frac{\pi}{3} = \underline{\underline{\frac{4\pi}{3}}}$$

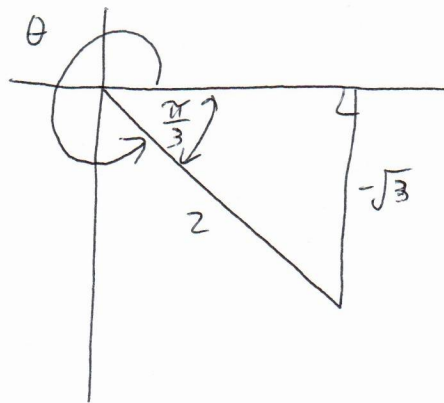
$$16) 2 \sin \theta = -\sqrt{3} \rightarrow \sin \theta = \frac{-\sqrt{3}}{2}$$

Q III



$$\theta = \pi + \frac{\pi}{3} = \underline{\underline{\frac{4\pi}{3}}}$$

Q IV

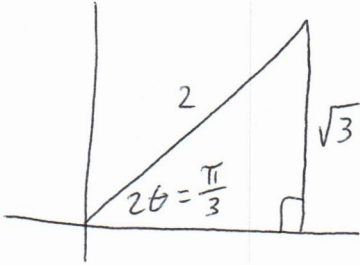


$$\theta = 2\pi - \frac{\pi}{3} = \underline{\underline{\frac{5\pi}{3}}}$$

for 17 to 22, let solve for angle (a theta), then find theta

$$18) 2 \sin(2\theta) = \sqrt{3} \rightarrow \sin(2\theta) = \frac{\sqrt{3}}{2}$$

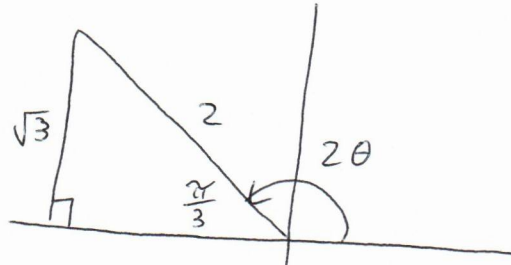
Q I



$$2\theta = \frac{\pi}{3}$$

$$\theta = \frac{\pi}{6}$$

Q II

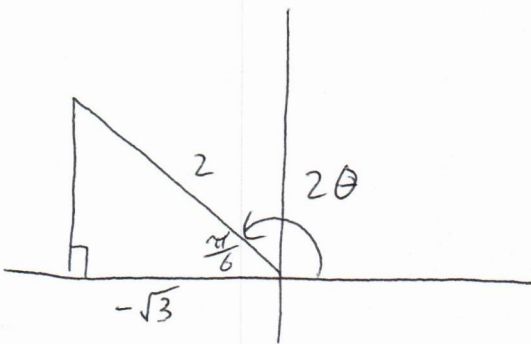


$$2\theta = \pi - \frac{\pi}{3} = \frac{2\pi}{3}$$

$$\theta = \frac{\pi}{3}$$

$$20) \cos(2\theta) = -\frac{\sqrt{3}}{2}$$

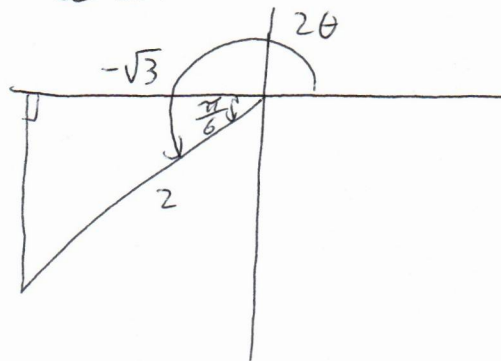
Q II



$$2\theta = \pi - \frac{\pi}{6} = \frac{5\pi}{6}$$

$$\theta = \frac{5\pi}{12}$$

Q III



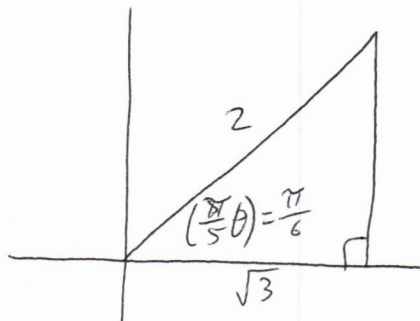
$$2\theta = \pi + \frac{\pi}{6} = \frac{7\pi}{6}$$

$$\theta = \frac{7\pi}{12}$$

$$22) 2 \cos\left(\frac{\pi}{5}\theta\right) = \sqrt{3} \rightarrow \cos\left(\frac{\pi}{5}\theta\right) = \frac{\sqrt{3}}{2}$$

9.5L6

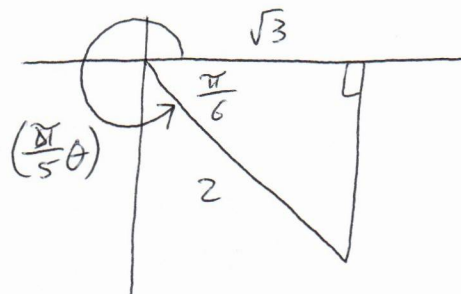
Q I



$$\left(\frac{\pi}{5}\theta\right) = \frac{\pi}{6}$$

$$\theta = \left(\frac{\pi}{6}\right)\left(\frac{5}{\pi}\right) = \underline{\underline{\frac{5}{6}}}$$

Q IV



$$\left(\frac{\pi}{5}\theta\right) = 2\pi - \frac{\pi}{6} = \frac{11\pi}{6}$$

$$\theta = \left(\frac{11\pi}{6}\right)\left(\frac{5}{\pi}\right) = \underline{\underline{\frac{55}{6}}}$$

skip to exercise 41

$$42) \sin^2 x + \sin x - 2 = 0$$

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

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

$$\sin x + 2 = 0$$

$$\sin x = -2$$

discard

$$\sin x - 1 = 0$$

$$\sin x = 1$$

$$\underline{\underline{x = \frac{\pi}{2}}}$$

skip 43-49, 54-65, 33-37

$$50) \sin^2 x - \cos^2 x - \sin x = 0$$

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

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

$$2\sin^2 x - \sin x - 1 = 0$$

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

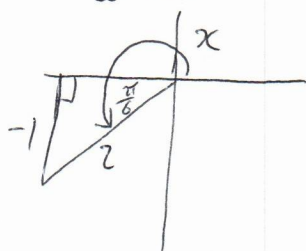
$$(2\sin x + 1)(\sin x - 1) = 0$$

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

$$2\sin x = -1$$

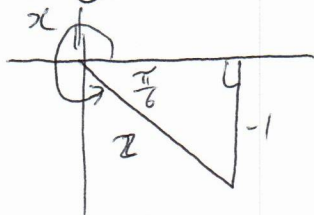
$$\sin x = -\frac{1}{2}$$

Q III



$$x = \pi + \frac{\pi}{6} = \underline{\underline{\frac{7\pi}{6}}}$$

Q IV



$$x = 2\pi - \frac{\pi}{6} = \underline{\underline{\frac{11\pi}{6}}}$$

$$\sin x - 1 = 0$$

$$\sin x = 1$$

$$\underline{\underline{x = \frac{\pi}{2}}}$$

$$52) \sin(2x) - \sin x = 0$$

$$(2 \sin x \cos x) - \sin x = 0$$

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

$$\sin x = 0$$

$$\underline{\underline{x = 0}}$$

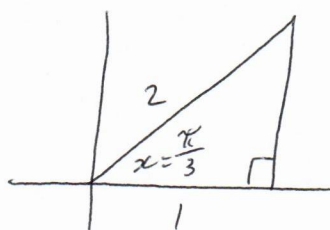
$$\underline{\underline{x = \pi}}$$

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

$$2 \cos x = 1$$

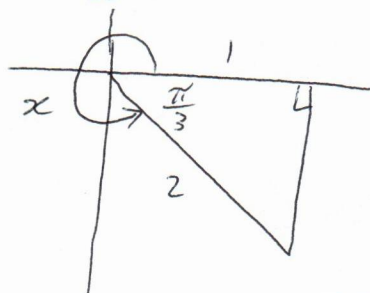
$$\cos x = \frac{1}{2}$$

Q I



$$\underline{\underline{x = \frac{\pi}{3}}}$$

Q IV



$$\underline{\underline{x = 2\pi - \frac{\pi}{3} = \frac{5\pi}{3}}}$$

returning to 23 -

$$24) \tan(x) - 2 \sin(x) \tan(x) = 0$$

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

$$\tan(x) = 0$$

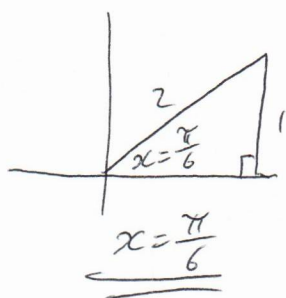
$$\underline{\underline{x = 0}}$$

$$\underline{\underline{x = \pi}}$$

$$1 - 2 \sin(x) = 0 \quad \text{Q I}$$

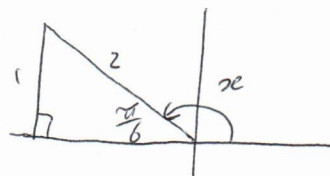
$$1 = 2 \sin(x)$$

$$\frac{1}{2} = \sin(x)$$



$$\underline{\underline{x = \frac{\pi}{6}}}$$

Q II



$$\underline{\underline{x = \pi - \frac{\pi}{6} = \frac{5\pi}{6}}}$$

$$26) 2 \tan^2(x) = 3 \sec(x)$$

$$2(\sec^2(x) - 1) = 3 \sec(x)$$

$$2 \sec^2(x) - 3 \sec(x) - 2 = 0$$

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

$$2 \sec(x) + 1 = 0$$

$$2 \sec(x) = -1$$

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

$$\cos(x) = \frac{1}{\sec(x)}$$

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

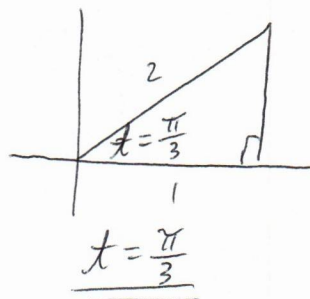
discard

$$\sec(x) - 2 = 0$$

$$\sec(x) = 2$$

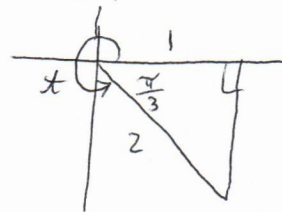
$$\cos(x) = \frac{1}{\sec(x)} = \frac{1}{(2)} = \frac{1}{2}$$

Q I



$$\underline{\underline{x = \frac{\pi}{3}}}$$

Q IV

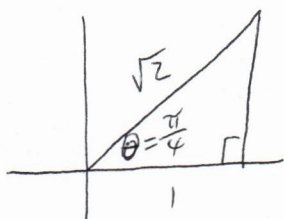


$$\underline{\underline{x = 2\pi - \frac{\pi}{3} = \frac{5\pi}{3}}}$$

$$28) \cos^2 \theta = \frac{1}{2} \rightarrow \cos \theta = \pm \sqrt{\frac{1}{2}} = \pm \frac{\sqrt{1}}{\sqrt{2}} = \pm \frac{1}{\sqrt{2}}$$

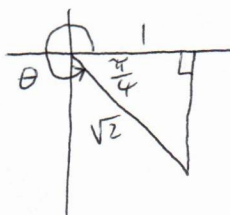
$$\cos \theta = \frac{+1}{\sqrt{2}}$$

Q I



$$\underline{\underline{\theta = \frac{\pi}{4}}}$$

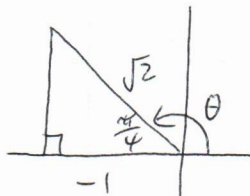
Q IV



$$\underline{\underline{\theta = 2\pi - \frac{\pi}{4} = \frac{7\pi}{4}}}$$

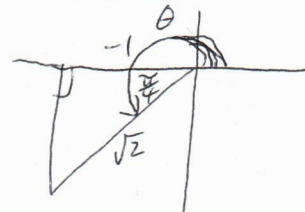
$$\cos \theta = \frac{-1}{\sqrt{2}}$$

Q II



$$\underline{\underline{\theta = \pi - \frac{\pi}{4} = \frac{3\pi}{4}}}$$

Q III



$$\underline{\underline{\theta = \pi + \frac{\pi}{4} = \frac{5\pi}{4}}}$$

$$30) \tan^2(x) = -1 + 2 \tan(-x)$$

$$\tan^2(x) = -1 + 2(-\tan(x))$$

$$\tan^2(x) + 2 \tan(x) + 1 = 0$$

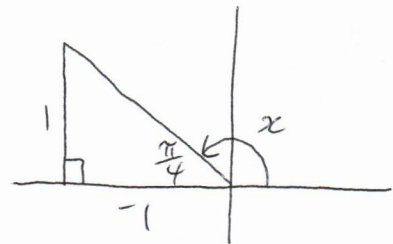
$$(\tan(x) + 1)(\tan(x) + 1) = 0$$

$$(\tan(x) + 1)^2 = 0$$

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

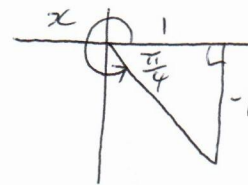
$$\tan(x) = -1 = \frac{-1}{1}$$

Q II



$$x = \pi - \frac{\pi}{4} = \underline{\underline{\frac{3\pi}{4}}}$$

Q IV



$$x = 2\pi - \frac{\pi}{4} = \underline{\underline{\frac{7\pi}{4}}}$$

$$32) \tan^5(x) = \tan(x)$$

$$\tan^5(x) - \tan(x) = 0$$

$$\tan(x) (\tan^4(x) - 1) = 0$$

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

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

$$\tan(x) = 0$$

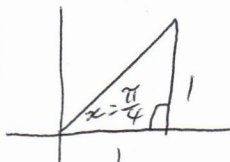
$$\underline{\underline{x = 0}}$$

$$\underline{\underline{x = \pi}}$$

$$\tan(x) - 1 = 0$$

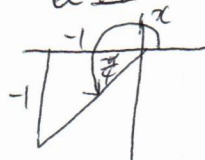
$$\tan(x) = 1 = \frac{1}{1} = \frac{1}{1}$$

Q I



$$\underline{\underline{x = \frac{\pi}{4}}}$$

Q III

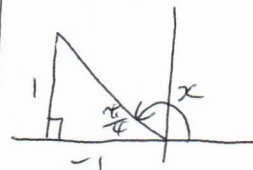


$$x = \pi + \frac{\pi}{4} = \underline{\underline{\frac{5\pi}{4}}}$$

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

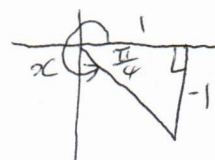
$$\tan(x) = -1 = \frac{-1}{1}$$

Q II



$$x = \pi - \frac{\pi}{4} = \underline{\underline{\frac{3\pi}{4}}}$$

Q IV



$$x = 2\pi - \frac{\pi}{4} = \underline{\underline{\frac{7\pi}{4}}}$$

$$38) \sin(2t) = \cos t$$

$$2 \sin t \cos t = \cos t$$

$$2 \sin t \cos t - \cos t = 0$$

$$\cos t (2 \sin t - 1) = 0$$

$$\cos t = 0$$

$$t = \frac{\pi}{2}$$

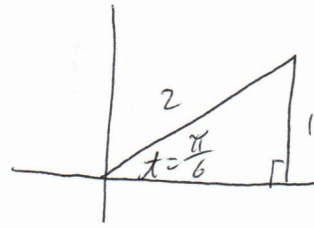
$$t = \frac{3\pi}{2}$$

$$2 \sin t - 1 = 0$$

$$2 \sin t = 1$$

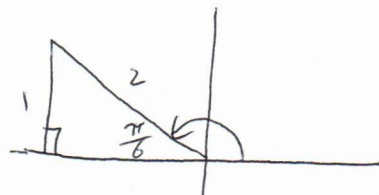
$$\sin t = \frac{1}{2}$$

Q I



$$t = \frac{\pi}{6}$$

Q II



$$t = \pi - \frac{\pi}{6} = \frac{5\pi}{6}$$

$$40) \cos(6x) - \cos(3x) = 0$$

$$\cos(2(3x)) - \cos(3x) = 0$$

$$(2 \cos^2(3x) - 1) - \cos(3x) = 0$$

$$2 \cos^2(3x) - \cos(3x) - 1 = 0$$

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

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

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

$$3x = 0$$

$$x = 0$$

$$3x = 2\pi$$

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

$$3x = 4\pi$$

$$x = \frac{4\pi}{3}$$

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

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

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

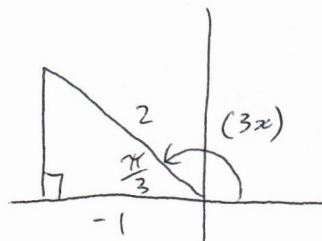
$$(3x) = \frac{4\pi}{3} + 2\pi = \frac{4\pi}{3} + \frac{6\pi}{3} = \frac{10\pi}{3} \rightarrow x = \frac{10\pi}{9}$$

$$(3x) = \frac{4\pi}{3} + 4\pi = \frac{4\pi}{3} + \frac{12\pi}{3} = \frac{16\pi}{3} \rightarrow x = \frac{16\pi}{9}$$

Q II

$$(3x) = \pi - \frac{\pi}{3} = \frac{2\pi}{3}$$

$$x = \frac{2\pi}{9}$$



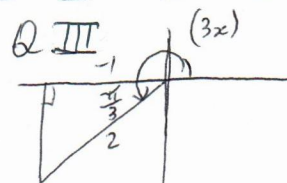
$$(3x) = \frac{2\pi}{3} + 2\pi = \frac{2\pi}{3} + \frac{6\pi}{3} = \frac{8\pi}{3}$$

$$x = \frac{8\pi}{9}$$

$$(3x) = \frac{2\pi}{3} + 4\pi = \frac{2\pi}{3} + \frac{12\pi}{3} = \frac{14\pi}{3}$$

$$x = \frac{14\pi}{9}$$

Q III



$$(3x) = \pi + \frac{\pi}{3} = \frac{4\pi}{3}$$

$$x = \frac{4\pi}{9}$$