

$$2\sin x(\sin x - 1) + 5\sin x = -1, \quad -4\pi < x < 2\pi$$

$$2\sin^2 x - 2\sin x + 5\sin x + 1 = 0$$

$$2\sin^2 x + 3\sin x + 1 = 0$$

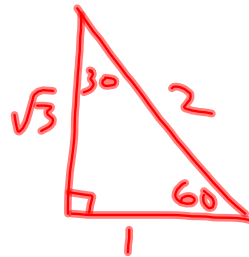
$$2m^2 + 3m + 1 = 0$$

$$2m^2 + 2m + m + 1 = 0$$

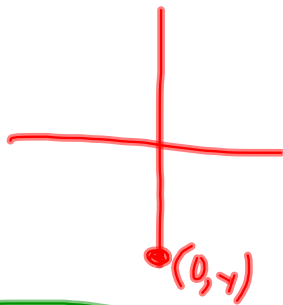
$$2m(m+1) + 1(m+1) = 0$$

$$(m+1)(2m+1) = 0$$

$$m = -1 \quad \text{OR} \quad m = -\frac{1}{2}$$



$\sin x = -1$    
 Quadrantal !!   
 $y = -1$



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

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

$\left( \text{Ref } \frac{\pi}{6}, \text{ Q3, 4} \right)$

$$\begin{aligned}
 & \frac{12\pi}{6}, \frac{11\pi}{6}, \frac{7\pi}{6}, \frac{5\pi}{6} \\
 & \frac{6\pi}{6}, \frac{3\pi}{6}, \frac{\pi}{6} \\
 & \theta = \frac{11\pi}{6}, \frac{7\pi}{6} \\
 & -\frac{\pi}{6}, -\frac{5\pi}{6} \\
 & -\frac{13\pi}{6}, -\frac{17\pi}{6}
 \end{aligned}$$



$$13 \cos \theta + 2 = 8(1 - \cos^2 \theta), \quad -360^\circ \leq \theta \leq 1080^\circ$$

$$m = \cos \theta$$

$$13m + 2 = 8(1 - m^2)$$

$$13m + 2 = 8 - 8m^2$$

$$8m^2 + 13m - 6 = 0 \implies m = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$8m^2 + 16m - 3m - 6 = 0$$

$$8m(m+2) - 3(m+2) = 0$$

$$(m+2)(8m-3) = 0$$

$$m = -2$$

$$m = \frac{3}{8}$$

$$\cos x = -2$$

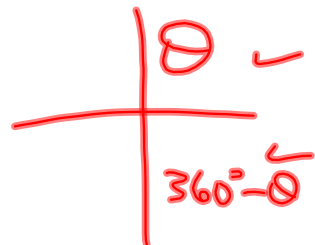
$$\cos x = \frac{3}{8}$$

Impossible!!

$$\cos x = \frac{x}{r} \text{ or } \frac{\text{adj}}{\text{hyp}}$$

$$-1 \leq \cos x \leq 1$$

$\emptyset$



(Ref  $\angle 68^\circ$ , Q 1, 4)

$$\theta = \pm 68^\circ, \pm 292^\circ$$

$$428^\circ, 652^\circ$$

$$788^\circ, 1012^\circ$$

Solutions:

1)  $90^\circ, 450^\circ, -270^\circ, 199^\circ, 341^\circ, 559^\circ, 701^\circ, -161^\circ, -19^\circ$

2)  $\frac{49\pi}{180}, \frac{131\pi}{180}, \frac{-311\pi}{180}, \frac{-229\pi}{180}, \frac{37\pi}{30}, \frac{53\pi}{30}, \frac{-23\pi}{30}, \frac{-7\pi}{30}$

3)  $0, \pm\frac{\pi}{2}, \pm\frac{3\pi}{2}, \pm 2\pi, \pm\frac{5\pi}{2}, \pm\frac{7\pi}{2}, \pm 4\pi, \pm\frac{2\pi}{3}, \pm\frac{4\pi}{3}, \pm\frac{8\pi}{3}, \pm\frac{10\pi}{3}$

4)  $270^\circ, 630^\circ, -90^\circ, 30^\circ, 150^\circ, 390^\circ, 510^\circ, -330^\circ, -210^\circ$

5)  $\frac{\pi}{3}, \frac{5\pi}{3}$     6) No Solutions