

I) 1) -1

2) $\frac{\sqrt{3}}{3}$

3) 2

4) $-\frac{\sqrt{3}}{3}$

5) $-\sqrt{3}$

6) $\frac{\sqrt{2}}{2}$

7) $\frac{1}{2}$

8) $\frac{\sqrt{2}}{2}$

9) -1

10) -1

11) $\frac{2\sqrt{3}}{3}$

12) $-\frac{\sqrt{2}}{2}$

13) -1

14) -2

II) 1) $\pi/6$

2) $\pi/3$

3) $\pi/6$

4) $\pi/6$

5) $\pi/4$

6) $\pi/4$

7) $-\pi/6$

8) $2\pi/3$

9) $-\pi/6$

10) $5\pi/6$

11) $-\pi/4$

12) $-\pi/4$

III)

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

$2 \cos x + 2 = 1$

$2 \cos x = -1$

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

Cosine is negative in Quadrants II, III

$\cos x = -\frac{1}{2} \Rightarrow$ reference \angle of $\frac{\pi}{3}$ (60°)

$x = \frac{2\pi}{3}, \frac{4\pi}{3}$

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

$4\sin^2 x = 1$

$\sin^2 x = \frac{1}{4}$

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

$\sin x = \frac{1}{2}$ has reference \angle of 30°

need to examine all four quadrants

$x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

Can also be solved by factoring:

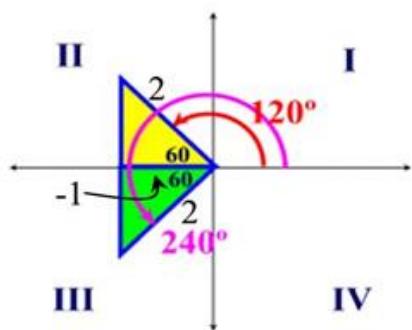
$4\sin^2 x - 1 = 0$

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

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

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

(finish as in first method)



3) $5\sin^2 x - 4\sin x - 1 = 0$

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

$5\sin x + 1 = 0 \quad \text{or} \quad \sin x - 1 = 0$

$5\sin x = -1$

$\sin x = 1 \Rightarrow x = 90^\circ$

$\sin x = -\frac{1}{5} = -0.2$

 $\sin < 0$ in Quadrants III, IV

$x = -12^\circ$

$x = 192^\circ, 348^\circ, 90^\circ$

IV)

