

$$a) \cos^2 x - \sin^2 x = 2 \sin x - 1$$

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

15

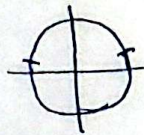
درمیان نوری

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

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

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

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



$$x = 2k\pi + \pi/6, 2k\pi + 5\pi/6$$

$$b) \cos^2 x - \sin^2 x + \cos x - 1 = 0 \rightarrow 2 \cos^2 x + \cos x - 1 = 0$$

$$\cos x \rightarrow \frac{1}{2} \checkmark$$



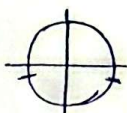
$$x = 2k\pi$$

$$a) -(\cos^2 x - \sin^2 x) = 2 \sin x \cos x$$

$$-\cos^2 x = 2 \sin x \cos x \rightarrow \cos x = -2 \sin x$$

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

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

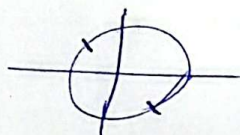


$$2x = 2k\pi - \pi/4 \rightarrow x = k\pi - \pi/8$$

$$2x = 2k\pi - 3\pi/4 \rightarrow x = k\pi - 3\pi/8$$

$$b) 2 \cos^2 x + 2 \sin x \cos x = \sin^2 x + \cos^2 x \rightarrow \cos^2 x - \sin^2 x + 2 \sin x \cos x = 0$$

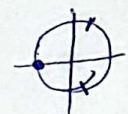
$$\cos^2 x + \sin^2 x = 0$$



$$2x = k\pi - \pi/4 \rightarrow x = \frac{k\pi}{2} - \frac{\pi}{8}$$

$$a) 2 \cos x + 1 = \frac{1}{\cos x} \rightarrow 2 \cos^2 x + \cos x = 1 \rightarrow 2 \cos^2 x + \cos x - 1 = 0$$

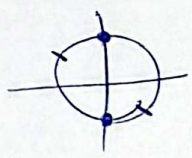
$$\cos x \rightarrow \frac{-1}{2}$$



$$x = 2k\pi + \pi, 2k\pi \pm \frac{2\pi}{3}$$

$$b) 2 \sin^2 x - \sin x \cos x + \cos^2 x = 2 \sin^2 x + 2 \cos^2 x \rightarrow \cos^2 x + \sin x \cos x = 0$$

$$\cos x (\cos x + \sin x) = 0 \rightarrow \begin{cases} \cos x = 0 \\ \cos x + \sin x = 0 \end{cases}$$



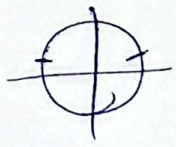
$$x = k\pi - \pi/4$$

$$x = 2k\pi \pm \pi/4$$

$$a) \cos(\pi/4 + x) \cos(\pi/4 - x) = \frac{1}{2} \rightarrow \cos(\pi/4 + x) \sin(\pi/4 + x) = \frac{1}{2}$$

$$2 \sin(\pi/4 + x) \cos(\pi/4 + x) = \frac{1}{2}$$

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



$$2x + \pi/2 = 2k\pi + \pi/6$$

$$2x + \pi/2 = 2k\pi + 5\pi/6$$

$$2x = 2k\pi - \pi/3 \rightarrow x = k\pi - \pi/6$$

$$2x = 2k\pi + \pi/3 \rightarrow x = k\pi + \pi/6$$

$$x = k\pi \pm \pi/6$$

10

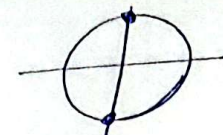
$$b) \cos(2x - \pi/4) = \sin(\frac{11\pi}{12} - 2x) \rightarrow \sin(\frac{11\pi}{12} - 2x) = -\sin 2x = \sin -2x$$

$$\sin(2x - \frac{11\pi}{12}) = \sin 2x$$

$$2x = 2k\pi + \pi - 2x + \frac{11\pi}{12} \rightarrow 4x = 2k\pi + \frac{29\pi}{12}$$

$$x = \frac{k\pi}{2} + \frac{29\pi}{24}$$

$$\frac{r \sin^2 x \cos^2 x + \sin^2 x}{\sin^2 x} - \sin^2 x = \cos^2 x \rightarrow \frac{\sin^2 x (r \cos^2 x + 1)}{\sin^2 x} = 1$$

$$r \cos^2 x = 0 \quad \cos^2 x = 0$$


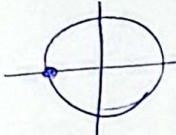
$$rx = k\pi \pm \frac{\pi}{r} \quad x = \frac{k\pi}{r} \pm \frac{\pi}{r}$$

$$\frac{r \sin \frac{x}{r} \cos \frac{x}{r}}{r \cos^2 \frac{x}{r}} = \frac{1 + \cos \frac{x}{r}}{\sin \frac{x}{r}} \rightarrow \frac{\sin \frac{x}{r}}{\cos \frac{x}{r}} = \frac{r \cos^2 \frac{x}{r}}{r \sin \frac{x}{r} \cos \frac{x}{r}} \rightarrow \frac{\sin \frac{x}{r}}{\cos \frac{x}{r}} = \frac{\cos \frac{x}{r}}{\sin \frac{x}{r}}$$

$$\tan \frac{x}{r} = \cot \frac{x}{r}$$


$$x = -\pi, \pi \quad \pi + \pi = r\pi$$

$$\frac{x}{r} = \frac{k\pi}{r} + \frac{\pi}{r} \quad x = r k \pi + \pi$$

$$\cos^2 x - \sin^2 x \cos^2 x = \cos^2 x + \sin^2 x \quad -\sin^2 x \cos^2 x = \sin^2 x \quad \cos^2 x = -1$$


$$rx = \pi \quad x = \frac{\pi}{r}$$

$$\sin x = 0 \rightarrow 0, \pi, 2\pi$$

$$x = \frac{\pi}{r}, \pi, \frac{3\pi}{r}$$

$$\frac{1 - \tan x}{1 + \tan x} = \frac{\tan \frac{\pi}{r} - \tan x}{1 + \tan \frac{\pi}{r} \tan x} = \tan(\frac{\pi}{r} - x) \rightarrow \tan(\frac{\pi}{r} - x) = \tan^2 x$$

$$rx = k\pi + \frac{\pi}{r} - x \quad rx = k\pi + \frac{\pi}{r}$$

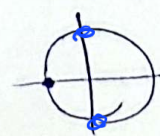
$$x = \frac{k\pi}{r} + \frac{\pi}{r}$$

$$\sqrt{\sin^2 x + \cos^2 x + r \sin x \cos x} = \sqrt{r} \cos^2 x$$

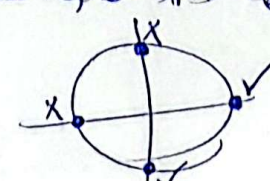
$$\sqrt{(\sin x + \cos x)^2} = \sqrt{r} \cos^2 x$$

$$\sin rx = -1 \rightarrow x = k\pi - \frac{\pi}{r} \rightarrow \frac{k\pi}{r}$$

$$x = k\pi + \frac{\pi}{r} \rightarrow \frac{\pi}{r}$$

$$\cos^2 x - \sin^2 x = -1 \quad \cos^2 x = -1$$


$$rx = \pi \quad x = \frac{\pi}{r}$$

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


$$x = 0, \frac{r\pi}{r}, r\pi$$