

$$\text{الف) } \cos^2 x = 2 \sin x - 1 \rightarrow 1 - 2 \sin^2 x = 2 \sin x - 1 \rightarrow 2 \sin^2 x + 2 \sin x - 2 = 0$$

$$\sin x = \frac{-2 \pm \sqrt{20}}{4} = \frac{-2 \pm 2\sqrt{5}}{4} = \frac{-1 \pm \sqrt{5}}{2}$$

چون

$$\boxed{x = 2k\pi + \frac{\pi}{4}}$$

$$\boxed{x = 2k\pi + \frac{3\pi}{4}}$$

$$\text{ب) } \cos^2 x + \cos x - 2 = 0 \rightarrow 2 \cos^2 x + 2 \cos x - 2 = 0 \rightarrow \cos x = 1 / -2$$

$$\boxed{x = 2k\pi}$$

$$\text{ج) } \sin^2 x - \cos^2 x = \sin x \rightarrow (\sin^2 x + \cos^2 x) (\sin^2 x - \cos^2 x) = 2 \sin x \cos x \sin x$$

$$\rightarrow -1 = 2 \sin x \rightarrow \sin x = -\frac{1}{2} \rightarrow x = 2k\pi + \frac{3\pi}{4} \rightarrow \boxed{x = 2k\pi + \frac{3\pi}{4}}$$

$$x = 2k\pi + \pi - \frac{\pi}{4} = 2k\pi + \frac{3\pi}{4} \rightarrow \boxed{x = 2k\pi + \frac{3\pi}{4}}$$

$$\text{د) } 2 \cos^2 x + 2 \sin x \cos x = 1 \rightarrow \cos^2 x + \sin^2 x = 0 \rightarrow \cos^2 x = -\sin^2 x = \sin^2(-x)$$

$$(\cos^2 x = \cos^2(\frac{\pi}{4} + x)) \rightarrow x = 2k\pi + \frac{\pi}{4} + k\pi$$

$$x = 2k\pi + \frac{\pi}{4} - k\pi \rightarrow x = 2k\pi - \frac{\pi}{4} \rightarrow \boxed{x = 2k\pi - \frac{\pi}{4}}$$

$$\text{ه) } \cot x (2 \cos x + 1) = \frac{1}{\sin x} \rightarrow \cos x (2 \cos x + 1) = 1 \quad \sin x \neq 0$$

$$\rightarrow 2 \cos^2 x + \cos x - 1 = 0 \rightarrow \cos x = -1 / \frac{1}{2} \rightarrow x = 2k\pi + \pi$$

$$\boxed{x = 2k\pi + \pi}$$

$$\text{و) } 2 \sin^2 x - \sin x \cos x + \cos^2 x = 2 \rightarrow 2 \sin^2 x - \sin x \cos x + \cos^2 x = 0$$

$$\frac{2 \sin^2 x - 1}{-2 \cos^2 x}$$

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

$$\boxed{x = 2k\pi + \frac{\pi}{2}}$$

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

$$a) \cos\left(\frac{\pi}{p} + \pi\right) \cos\left(\pi - \frac{\pi}{p}\right) = \frac{1}{p} \rightarrow \cos\left(\pi + \frac{\pi}{p}\right) \times \sin\left(\pi + \frac{\pi}{p}\right)$$

$$= \frac{1}{p} \sin\left(\pi + \frac{\pi}{p}\right) = \frac{1}{p} \sin\left(\pi + \frac{\pi}{p}\right) = \frac{1}{p} \rightarrow \sin\left(\pi + \frac{\pi}{p}\right) = \frac{1}{p} \rightarrow \cos \pi = \frac{1}{p}$$

$$\rightarrow \pi = \pi k \pm \frac{\pi}{p} \rightarrow \pi = \frac{\pi k \pm \frac{\pi}{p}}{4} \quad \checkmark$$

$$b) \cos\left(\pi k - \frac{\pi}{q}\right) = -\sin \pi k = \sin(-\pi k) = \cos\left(\frac{\pi}{p} + \pi k\right)$$

$$\rightarrow \pi k - \frac{\pi}{q} = \pi k \pi + \frac{\pi}{p} + \pi k \rightarrow \text{SÖZ}$$

$$\pi k - \frac{\pi}{q} = \pi k \pi - \frac{\pi}{p} - \pi k \rightarrow \pi k = \pi k \pi - \frac{\pi}{p} + \frac{\pi}{q} \rightarrow \pi = \frac{\pi k \pi - \frac{\pi}{p}}{\pi r}$$

$$\frac{\sin \pi k + \sin \pi k}{\sin \pi k} = \sin \pi k = \cos \pi k \rightarrow \frac{\sin \pi k \cos \pi k + \sin \pi k}{\sin \pi k} = 1$$

$$\rightarrow \frac{\sin \pi k (\cos \pi k + 1)}{\sin \pi k} = 1 \rightarrow \cos \pi k + 1 = 1 \rightarrow \cos \pi k = 0 \quad \pi k = \pi k + \frac{\pi}{p}$$

$$\pi = \frac{\pi k \pi + \frac{\pi}{p}}{p}$$

$$\frac{\sin \frac{\pi}{p}}{1 + \cos \frac{\pi}{p}} = \frac{1}{\sin \frac{\pi}{p}} + \cot \frac{\pi}{p}$$

$$\rightarrow \tan \frac{\pi}{p} = \frac{1}{-\tan \frac{\pi}{p}} \rightarrow \tan^2 \frac{\pi}{p} = 1 \rightarrow \tan \frac{\pi}{p} = \pm 1$$

$$\frac{1 + \cos \frac{\pi}{p}}{\sin \frac{\pi}{p}}$$

$$\sin \neq 0 \rightarrow \frac{\pi}{p} \neq \pi k$$

$$\cos \neq 0 \rightarrow \frac{\pi}{p} \neq \pi k + \frac{\pi}{p}$$

$$\frac{\pi}{p} = \frac{\pi k \pi + \frac{\pi}{p}}{p} \rightarrow \pi = \pi k \pi + \frac{\pi}{p}$$

$$\rightarrow \pi = \pi / - \pi$$

$$\checkmark \quad |\pi - \pi| = \pi$$

$$\cos \pi - \sin \pi \cos \pi = 1 \rightarrow \cos^2 \pi - 1 - \sin^2 \pi \cos \pi = 0$$

$$\sin^2 \pi (1 + \cos \pi) = 0 \rightarrow \sin \pi = 0 \rightarrow \pi = 0, \pi, 2\pi$$

$$1 + \cos \pi = 0 \rightarrow \cos \pi = -1 \rightarrow \pi = \pi k \pi + \pi \rightarrow \pi = \pi k \pi + \frac{\pi}{p}$$

$$\pi > 0$$

$$\rightarrow \pi = \frac{\pi k \pi + \frac{\pi}{p}}{p}$$

$$\frac{1 - \tan \alpha}{1 + \tan \alpha} = \tan \alpha$$

$$\frac{\tan \frac{\pi}{4} - \tan \alpha}{1 + \tan \frac{\pi}{4} \cdot \tan \alpha} = \tan(\frac{\pi}{4} - \alpha)$$

$$\rightarrow \tan(\frac{\pi}{4} - \alpha) = \tan \alpha$$

$$\rightarrow \pi = \frac{\pi}{4} + \frac{\pi}{4} - \alpha \rightarrow \alpha = \frac{\pi}{4} + \frac{\pi}{4}$$

$$\sqrt{1 + \sin \alpha} = \sqrt{r} \cos \alpha \rightarrow \sqrt{1 + 2 \sin \alpha \cos \alpha} = \sqrt{r} (\cos \alpha - \sin \alpha)$$

$$\rightarrow |\cos \alpha + \sin \alpha| = \sqrt{r} (\cos \alpha - \sin \alpha) \rightarrow \sqrt{r} |\cos \alpha - \sin \alpha| = 1$$

$$\sin^2 \alpha - \cos^2 \alpha = 1 \rightarrow \sin^2 \alpha - \cos^2 \alpha = 1 \rightarrow -\cos^2 \alpha = 1 \rightarrow \cos^2 \alpha = -1$$

$$\rightarrow \pi = \frac{\pi}{4} + \frac{\pi}{4} \rightarrow \pi = \frac{\pi}{4} + \frac{\pi}{4}$$

$$\sin^2 \alpha - \cos^2 \alpha = -1 \rightarrow \sin^2 \alpha - \cos^2 \alpha = -1$$

$$\alpha = 0 \rightarrow 0 - 1 = -1 \quad \alpha = \frac{\pi}{2} \rightarrow 1 - 0 = 1 \quad \alpha = \pi \rightarrow 0 - (-1) = 1 \quad \alpha = \frac{3\pi}{2} \rightarrow -1 - 0 = -1$$

$$\alpha = \frac{\pi}{4} \rightarrow 0 - 1 = -1 \rightarrow \alpha = \frac{\pi}{4} + \frac{\pi}{4}$$

$$\sqrt{1 + \sin \alpha} = \sqrt{r} \cos \alpha \rightarrow 1 + \sin \alpha = r \cos^2 \alpha$$

$$1 + \sin \alpha = r - r \sin^2 \alpha \rightarrow r \sin^2 \alpha + \sin \alpha - 1 = 0 \rightarrow \sin \alpha = -1$$

$$\sin \alpha = -1 \rightarrow \alpha = \frac{3\pi}{2}$$

$$\sin \alpha = \frac{1}{2} \rightarrow \alpha = \frac{\pi}{6} + \frac{\pi}{4} \rightarrow \alpha = \frac{\pi}{6} + \frac{\pi}{4}$$

چون عبارت به توان 2 رسيده است جواب زائد قبول نميگردد
به ازاي $\cos \alpha = \frac{\pi}{4}$ قسم مساوي به يك جواب را ميگيرد