

الف) $\cos^2 \alpha = \mu \sin \alpha - 1$ (۱)

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

$$1 - \mu \sin^2 \alpha = \mu \sin \alpha - 1$$

$$\rightarrow \mu \sin^2 \alpha + \mu \sin \alpha - \mu = 0$$

$$\sin^2 \alpha + \mu \sin \alpha - 1 = 0$$

$$\rightarrow (\sin \alpha + 1)(\sin \alpha - 1) = 0$$

$$\sin \alpha = -1 \quad \sin \alpha = 1$$

$$\sin \alpha = \frac{1}{\mu} \rightarrow 100^\circ, 0^\circ, 180^\circ$$

$$\rightarrow \mu \pi + \frac{\pi}{4} / \mu \pi + \pi - \frac{\pi}{4}$$

ب) $\cos^2 \mu + \cos \mu = \mu$

$$\cos^2 \alpha - \sin^2 \alpha + \cos \alpha = \mu$$

$$\cos^2 \alpha + \cos^2 \alpha - 1 + \cos \alpha = \mu \rightarrow \mu \cos^2 \alpha + \cos \alpha = \mu$$

لحظ فرمایید صورتها را با هم مقایسه کنید

$$\cos \alpha = 1 \rightarrow \mu = 0 \rightarrow \mu \pi$$

(۲)

الف) $\sin^2 \mu - \cos^2 \mu = \sin \mu$

$$1 - \cos^2 \mu = \mu \sin^2 \mu + \cos^2 \mu$$

$$\mu \sin^2 \mu + \cos^2 \mu = 1 \rightarrow \cos^2 \mu (1 + \mu) = 1$$

$$\rightarrow \cos^2 \mu = \frac{1}{1 + \mu} \rightarrow \mu = \mu \pi + \frac{\pi}{2} \rightarrow \mu = \mu \pi + \frac{\pi}{2}$$

از لباس کهنه ات خجالت نکش از افکار کهنه ات شرمندة باش

$$ب) \quad y \cos^2 m + y \sin m \cos m = 1$$

$$\cos^2 m + \sin^2 m = 1 \rightarrow (\cos^2 m + \sin^2 m)$$

$$\cos^2 m + \sin^2 m + y \sin m \cos m \rightarrow 1 + \sin m$$

$$\sin m = -1 \rightarrow m = \frac{3\pi}{2} + \frac{2\pi k}{1} \rightarrow m = \frac{3\pi}{2} + \frac{2\pi k}{1}$$

$$الف) \quad \cot m (y \cos m + 1) = \frac{1}{\sin m}$$

$$\frac{\cos}{\sin} (y \cos m + 1) = \frac{1}{\sin m} \times \frac{\sin}{\cos}$$

$$\rightarrow \frac{1}{\cos m} - \frac{y \cos m}{1} = 1 \rightarrow \frac{1 - y \cos^2 m}{\cos m} = 1$$

$$\rightarrow 1 - y \cos^2 m = \cos m \rightarrow y \cos^2 m + \cos m - 1 = 0$$

$$\cos^2 m + \cos m - y = 0 \rightarrow (\cos + y)(\cos - 1)$$

$$\cos m = \frac{-y}{1} \quad \cos m = \frac{1}{y}$$

$$\cos m = -1 \quad \cos m = \frac{1}{y}$$

$$\cos m = -1 \rightarrow 180^\circ$$

$$\cos m = \frac{1}{y} \rightarrow 40^\circ / 360^\circ$$

$$\rightarrow y \frac{3\pi}{2} + \frac{\pi}{2} / y \frac{3\pi}{2} + \frac{\pi}{2} / y \frac{3\pi}{2} - \frac{\pi}{2} / y \frac{3\pi}{2}$$

$$ب) \quad y \sin^2 m - \sin m \cos m + \cos^2 m = y$$

$$\sin^2 m + \sin^2 m + \cos^2 m - \sin m \cos m = y$$

$$-1 + \sin^2 m + \sin m \cos m = 0 \xrightarrow{+ \cos^2 m} \tan^2 m + \tan m - \frac{1}{\cos^2 m} = 0$$

$$+ \tan m = -1 \rightarrow m = \frac{3\pi}{2} - \frac{\pi}{2}$$

از گناه تنفر داشته باش نگاه کنه کار.

$$\rightarrow y \sin^2 m = y \rightarrow \sin^2 m = 1 \rightarrow \sin m = \pm 1$$

$$m = \frac{3\pi}{2} + \frac{\pi}{2}$$

$$\text{الف) } \cos\left(\frac{\pi}{k} + m\right) \cos\left(\frac{\pi}{k} - m\right) = \frac{1}{k}$$

$$\rightarrow m + \frac{\pi}{k} - m = \frac{\pi}{k}$$

زاویه متقیم است

$$\cos\left(m + \frac{\pi}{k}\right) \sin\left(m + \frac{\pi}{k}\right) = \frac{1}{k} \sin\left(2m + \frac{\pi}{k}\right) = \frac{1}{k}$$

$$\cos 2m = \frac{1}{k} \quad 2m = 2k\pi \pm \frac{\pi}{k} \rightarrow m = k\pi \pm \frac{\pi}{2k}$$

$$\text{ب) } \cos\left(2m - \frac{\pi}{k}\right) = -\sin 2m$$

$$\frac{\sin 2m + \sin 2m}{\sin 2m} - \sin 2m = \cos 2m$$

جمعه

$$\frac{\sin 2m}{\sin 2m} + 1 = \sin 2m + \cos 2m \rightarrow \frac{2 \sin m \cos m}{\sin 2m} =$$

$$2 \cos 2m = 0 \quad \cos 2m = 0$$

$$2m = 2k\pi \pm \frac{\pi}{2}$$

$$m = k\pi \pm \frac{\pi}{4}$$

۱۲

(۹)

$$\frac{\sin \frac{n}{r}}{1 + \cos \frac{n}{r}} = \frac{1}{\sin \frac{n}{r}} + \cot \frac{n}{r}$$

$$\tan \frac{n}{r} = \frac{1}{r} \tan \frac{n}{r} + \frac{1}{r} \cot \frac{n}{r} + \cot \frac{n}{r}$$

$$\tan \frac{n}{r} = t \rightarrow t = \frac{1}{r} \left(t + \frac{1}{t} \right) + \frac{1-t^r}{rt}$$

$$t = \frac{t^r + 1}{rt} + \frac{1-t^r}{rt} = \frac{1}{t} \rightarrow t = \frac{1}{t} \Rightarrow t = \pm 1$$

$$\tan \frac{n}{r} = \pm 1 \rightarrow \frac{n}{r} = k \frac{\pi}{r} + \frac{\pi}{r} \rightarrow n = (2k+1)\pi$$

$$\text{Mod } n \rightarrow n_1 = \pi, n_2 = \pi \rightarrow |\pi + \pi| = 2\pi$$

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

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

$$\begin{array}{l} \sin^2 m \neq 0 \rightarrow \cos^2 m = -1 \rightarrow m = (2k+1)\pi \\ \sin^2 m = 0 \rightarrow \sin m = 0 \rightarrow m = 2k\pi \end{array}$$

$$\rightarrow m \in \{0, 2\pi\} \Rightarrow \text{دو جواب}$$

$$\frac{1 - \tan m}{1 + \tan m} = \tan km$$

$$\rightarrow \cos km = \tan km \rightarrow \cos km = \frac{\sin km}{\cos km}$$

$$\sin km \times \cos km = \sin km$$

$$\frac{1}{r} \left(\sin(\cancel{km} + \cancel{km}) + \sin(\cancel{km} - \cancel{km}) \right) = \sin km$$

$$\frac{1}{r} \sin 4m = \sin km \rightarrow \frac{1}{r} \cancel{\sin km} \cos km = \cancel{\sin km}$$

$$\cos km = r \rightarrow r \cos^2 m - r \cos m = r$$

هنگامی که کسی آگاهانه تو را نمی فهمد خودت را برای توجیه خسته نکن.

$$\sqrt{1 + \sin^2 m} = \sqrt{2} \cos m \quad (9)$$

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

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

$$|\sin m + \cos m| = \sqrt{2} (1 - \sin^2 m - \sin^2 m)$$

$$|\sin m + \cos m| = \sqrt{2} (1 - r \sin^2 m)$$

الف) $\sin^2 m - \cos^2 m = 1$

(11)

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

$$r m = k\pi + \pi \rightarrow m = k\pi + \frac{\pi}{r} \rightarrow m \in \left\{ \frac{\pi}{r}, \frac{k\pi}{r} \right\}$$

ب) $\sin^2 m - \cos^2 m = -1$

$$\begin{aligned} \rightarrow m = 0 &\rightarrow 0 - (-1) = -1 \checkmark \\ \rightarrow m = \frac{\pi}{r} &\rightarrow 1 - 0 = 1 \times \\ \rightarrow m = \pi &\rightarrow 0 - (-1) = 1 \times \\ \rightarrow m = \frac{k\pi}{r} &\rightarrow -1 - 0 = -1 \checkmark \end{aligned}$$