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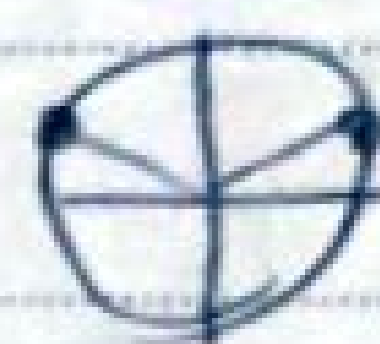
$$\text{الف) } \cos^2 n = \sin^2 n - 1$$

$$\cos^2 n = 1 - \sin^2 n \quad \text{مربع}$$

$$\rightarrow 1 - \sin^2 n - \sin^2 n + 1 = 0 \rightarrow \sin^2 n + \sin^2 n - 2 = 0 \rightarrow \sin^2 n + \sin^2 n - 2 = 0$$

$$(\sin n - 1)(\sin n + 1) = 0 \rightarrow \sin n = -1 \text{ أو } \sin n = 1$$

$$\sin n = \frac{1}{p}$$



$$n = k\pi + \frac{\pi}{2}$$

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

 $k \in \mathbb{Z}$

$$\text{ب) } \cos^2 n + \cos^2 n - 1 = 0$$

$$\cos^2 n = 1 - \cos^2 n \quad \text{مربع}$$

$$2\cos^2 n - 1 = 0 \rightarrow \cos^2 n = \frac{1}{2}$$

$$\cos n = 1$$

$$\cos n = \frac{1}{\sqrt{2}}$$



$$n = k\pi$$

$$\text{ج) } \sin^2 n - \cos^2 n = \sin^2 n$$

(1)

$$\rightarrow (\sin^2 n - \cos^2 n) - \sin^2 n = 0 \rightarrow -\cos^2 n = 0 \rightarrow \cos^2 n = 0$$

$$1 - \cos^2 n - \cos^2 n = 0 \rightarrow 1 - 2\cos^2 n = 0 \rightarrow \cos^2 n = \frac{1}{2}$$

$$-\cos^2 n = \sin^2 n \cos^2 n$$

$$\cos^2 n = 0 \rightarrow \cos n = 0 \rightarrow n = k\pi + \frac{\pi}{2}$$

$$\sin^2 n = \frac{1}{\cos^2 n} \rightarrow \sin^2 n = \sin^2\left(-\frac{\pi}{2}\right)$$

$$n = k\pi + \frac{\pi}{2}$$

$$n = k\pi - \frac{\pi}{2} \rightarrow n = k\pi - \frac{\pi}{2}$$

$$n = k\pi + \pi + \frac{\pi}{2} \rightarrow n = k\pi + \frac{3\pi}{2}$$

$$\text{د) } \cos^2 n + \sin^2 n \cos^2 n = 1$$

$$\frac{\cos^2 n}{\cos^2 n} + \sin^2 n = 1 \rightarrow \cos^2 n = 1 - \sin^2 n \rightarrow \sin\left(\frac{\pi}{2} - n\right) = \sin(n)$$

$$n = k\pi + \frac{\pi}{2} \rightarrow n = k\pi + \frac{\pi}{2}$$

$$n = k\pi + \pi + \frac{\pi}{2} \rightarrow n = k\pi + \frac{3\pi}{2} \rightarrow n = \frac{k\pi}{2} + \frac{\pi}{2}$$

$$\text{و) } \cot n (Y \cos n + 1) = \frac{1}{\sin n} \rightarrow \sin n \neq 0 \star$$

$$\frac{\cos n}{\sin n} \rightarrow \frac{Y \cos^2 n + \cos n}{\sin n} = \frac{1}{\sin n} \rightarrow Y \cos^2 n + \cos n - 1 = 0$$

$$\text{① } \cos n = \cos(R) \rightarrow n = YkR \pm R \quad \text{① } \cos n = -1 \quad \text{② } \cos n = \frac{1}{Y}$$

$$\text{③ } \cos n = \cos\left(\frac{R}{Y}\right) \rightarrow n = YkR \pm \frac{R}{Y} \rightarrow \sin n \neq 0$$

$$\text{ب) } Y \sin^2 n - \sin n \cos n + \cos n = Y$$

$$Y(1 - \cos n)$$

$$Y - Y \cos n + \cos n = Y + \sin n \cos n \rightarrow -\cos n = \sin n \cos n$$

$$\cos n = -\sin n \rightarrow \cos n = \cos\left(\frac{R}{Y} + n\right)$$

$$n = YkR + \frac{R}{Y} + n$$

$$n = YkR - \frac{R}{Y} - n \rightarrow Yn = YkR - \frac{R}{Y} \rightarrow n = kR - \frac{R}{Y}$$

$$\text{و) } \cos\left(\frac{R}{Y} + n\right) \cos\left(n - \frac{R}{Y}\right) = \frac{1}{Y} \quad \frac{R}{Y} + n + n - \frac{R}{Y} = \left(\frac{2R}{Y}\right) \quad (K)$$

$$\cos\left(\frac{R}{Y} + n\right) \sin\left(\frac{R}{Y} + n\right) = \frac{1}{Y} \rightarrow \frac{1}{Y} \sin\left(\frac{R}{Y} + n\right) = \frac{1}{Y}$$

$$\sin\left(\frac{R}{Y} + n\right) = \sin\left(\frac{R}{Y}\right) \rightarrow \frac{YR}{Y} + Yn = YkR + \frac{R}{Y} \rightarrow n = kR - \frac{R}{Y}$$

$$\frac{YR}{Y} + Yn = YkR + \frac{R}{Y} - \frac{R}{Y} \rightarrow n = kR + \frac{R}{Y}$$

$$\text{ب) } \cos\left(Yn - \frac{R}{Y}\right) = -\sin n \rightarrow -\cos\left(\frac{R}{Y} - n\right) = \cos\left(\frac{R}{Y} + n\right)$$

$$\rightarrow Yn - \frac{R}{Y} = YkR + \frac{R}{Y} + Yn \quad \star$$

$$\rightarrow Yn - \frac{R}{Y} = YkR - \frac{R}{Y} - n \rightarrow Yn = YkR - \frac{R}{Y} \rightarrow n = kR - \frac{R}{Y}$$

Arman

$$\frac{\sin \theta_m + \sin \theta_n}{\sin \theta_m} - \sin \theta_m = \cos \theta_m \quad (a)$$

$$\frac{r \sin \theta_m \cos \theta_m + \sin \theta_m}{\sin \theta_m} = \frac{r}{\cos \theta_m} + \sin \theta_m \rightarrow \frac{\sin \theta_m (r \cos \theta_m + 1)}{\sin \theta_m} = 1$$

$$r \cos \theta_m = 0 \rightarrow \cos \theta_m = \cos\left(\frac{R}{r}\right) \rightarrow \theta_m = \theta_n R \pm \frac{R}{r} \quad \sin \theta_m \neq 0$$

$$\theta_m = \theta_n R \pm \frac{R}{r}$$

$$\Rightarrow \text{وہاں} \rightarrow \theta_n R + \frac{R}{r}$$

(4)

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

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

$$r \cos \frac{\theta}{r} = r + \cos \frac{\theta}{r} + r \cos \frac{\theta}{r}$$

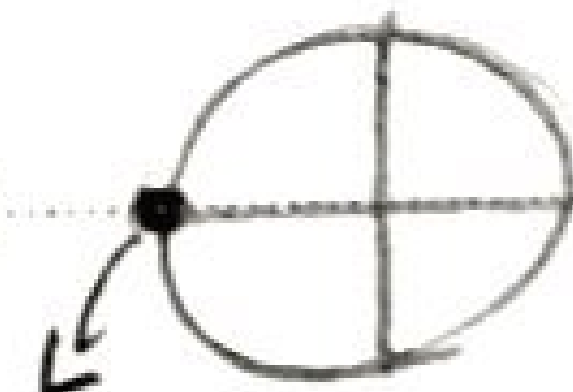
$$r \cos \frac{\theta}{r} + r \cos \frac{\theta}{r} = 0$$

$$\cos \frac{\theta}{r} = 0 \xrightarrow{\cos(R/r)} \frac{\theta}{r} = \theta_n R \pm \frac{R}{r} \rightarrow \theta = \theta_n R \pm R$$

$$r \cos \frac{\theta}{r} (\cos \frac{\theta}{r} + 1) = 0 \xrightarrow{\cos(R/r)} \frac{\theta}{r} = \theta_n R \pm R \rightarrow \theta = \theta_n R \pm R$$

$$\sin \frac{\theta}{r} \neq 0$$

$$\text{وہاں} = \theta_n R + R$$



$$\theta = \sqrt{2} R \rightarrow \text{وہاں} = |R + R| = \theta_n R$$

$$\left[-\sqrt{2}, \frac{\sqrt{2}}{r} \right] \checkmark$$

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

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

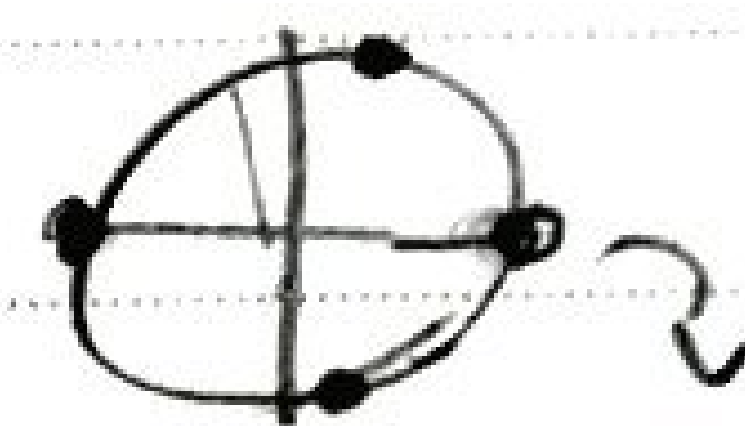
$$\sin^2 m = 0$$

$$-\cos^2 m = 1 \rightarrow \cos^2 m = -1 \rightarrow \cos^2 m = \cos^2(\pi)$$

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

$$\sin^2 m = 0 \rightarrow \sin m = 0 \rightarrow \begin{cases} m = k\pi \\ m = k\pi + \pi \end{cases}$$

$[0, 2\pi]$



$0, \pi, 2\pi$

$$\text{جواب} \rightarrow \frac{\pi}{\pi}, -\frac{\pi}{\pi}, \pi, 2\pi, 0 \rightarrow \text{جواب}$$

(^)

$$\frac{1 - \tan m}{1 + \tan m} = \tan m \rightarrow \frac{\tan \frac{\pi}{\pi} - \tan m}{1 + \tan \frac{\pi}{\pi} \tan m} \rightarrow \tan\left(\frac{\pi}{\pi} - m\right)$$

$$\tan\left(\frac{\pi}{\pi} - m\right) = \tan m \rightarrow m = k\pi + \frac{\pi}{\pi} - m$$

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

$$\sqrt{1 + \sin^2 m} = \sqrt{2} \cos^2 m \quad [0, \pi]$$

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$$\sqrt{1 + \sin^2 m} = \sqrt{2} \cos^2 m \rightarrow \sin^2 m = 2 \cos^2 m - 1$$

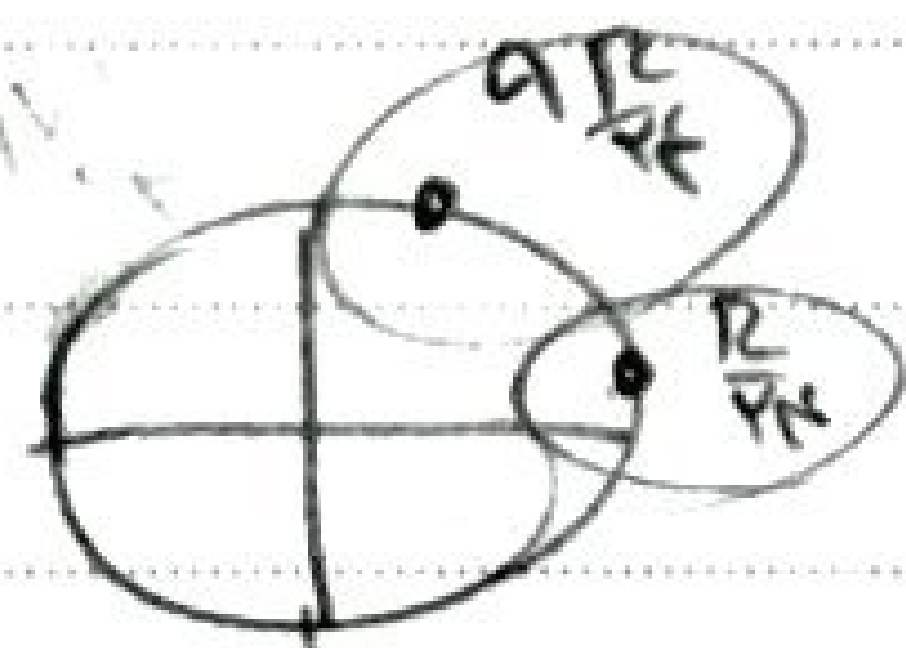
$$\sin^2 m = \cos^2 m \rightarrow \cos^2 m = \cos^2\left(\frac{\pi}{\pi} - m\right)$$

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

$$\cos^2\left(\frac{\pi}{\pi} - m\right)$$

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

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



جواب

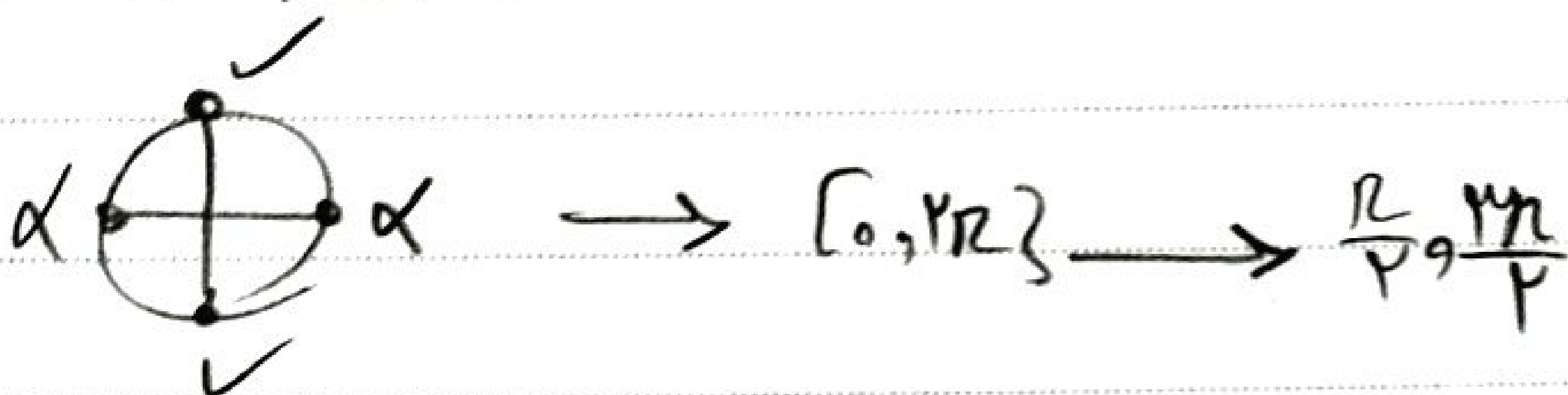
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1 $\sin^2 \alpha - \cos^2 \alpha = 1$ (ف)

110 $\frac{K\pi}{P}$ $\frac{K\pi}{P}$ $\frac{K\pi}{P}$



5 $\sin^2 \mu - \cos^2 \mu = -1$ (ب)

