

(1)

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

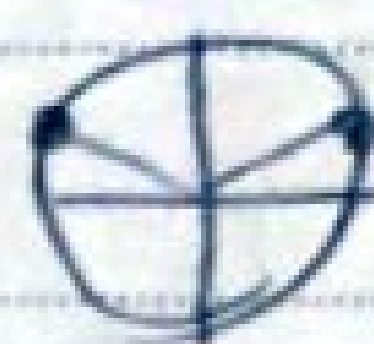
$$\cos^2 n = 1 - \sin^2 n \quad \text{دلیل}$$

(۲)

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

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

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



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

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

 $k \in \mathbb{Z}$

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

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

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

$$\cos n = 1 \quad \text{و } \cos n = -1$$



$$2k\pi$$

معادله فوق

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

(۲)

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

$$1 - \cos^2 n - \cos^2 n \rightarrow 1 - 2\cos^2 n = -\cos^2 n$$

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

$$\cos^2 n = 0 \rightarrow \cos n = \cos\left(\frac{\pi}{2}\right) \rightarrow n = 2k\pi + \frac{\pi}{2}$$

$$\sin^2 n = \frac{1}{2} \rightarrow \sin n = \sin\left(\frac{\pi}{4}\right)$$

$$n = 2k\pi + \frac{\pi}{4}$$

$$n = 2k\pi - \frac{\pi}{4} \rightarrow n = 2k\pi - \frac{\pi}{4}$$

$$n = 2k\pi + \pi + \frac{\pi}{4} \rightarrow n = 2k\pi + \frac{5\pi}{4}$$

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

$$\frac{2\cos^2 n}{\cos^2 n} + \sin^2 n = 0 \rightarrow \cos^2 n = -\sin^2 n \rightarrow \sin\left(\frac{\pi}{2} - n\right) = \sin(n)$$

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

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

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

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

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

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

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

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

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

$$\cos n = 0$$

$$\text{① } kR + \frac{R}{Y}$$



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

$$\sin(n)$$

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

$$n = YkR - \frac{R}{Y} - n \rightarrow n = YkR - \frac{R}{Y} \quad \text{و } n = kR - \frac{R}{Y}$$

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

$$\cos\left(\frac{R}{Y} - n\right)$$

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

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

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

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

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

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

Arman

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

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

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

$$\theta_m = kR \pm \frac{R}{r} \quad (\sin \theta_m \neq 0)$$

$$\Rightarrow \text{دایره} \rightarrow kR + \frac{R}{r}$$

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

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

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

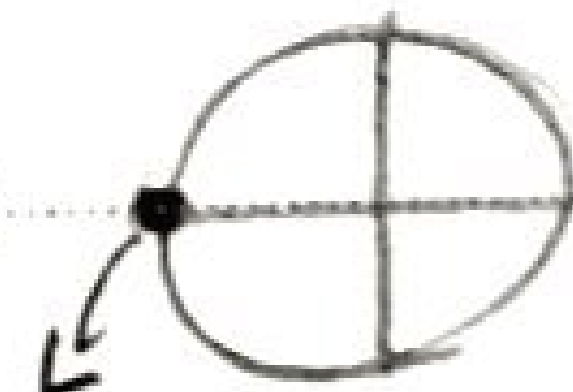
$$r \cos \frac{n}{r} + r \cos \frac{n}{r} = 0$$

$$\cos \frac{n}{r} = 0 \xrightarrow{\cos(R)} \frac{n}{r} = kR \pm \frac{R}{r} \rightarrow n = kRr \pm R$$

$$r \cos \frac{n}{r} (\cos \frac{n}{r} + 1) = 0 \rightarrow \cos \frac{n}{r} = -1 \xrightarrow{\cos(R)} \frac{n}{r} = kR \pm R \rightarrow n = kRr \pm rR$$

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

$$\text{دایره} = kRr + R$$



$$n = \sqrt{2} R \rightarrow \text{دایره} = |R + R| = rR$$

$$\left[-\frac{rR}{r}, \frac{rR}{r}\right]$$

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

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

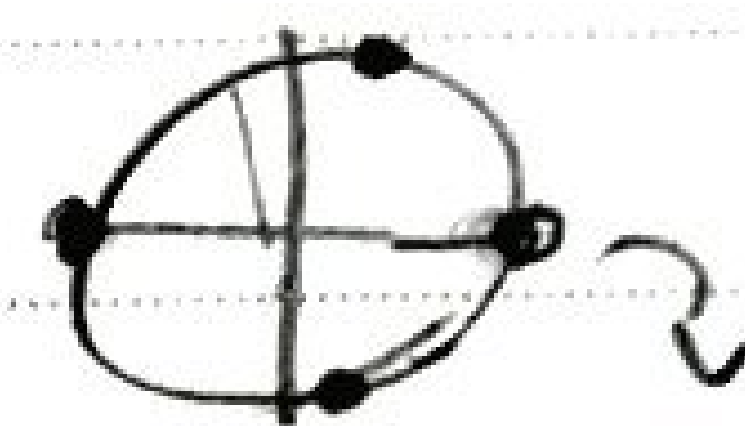
$$\sin^2 m = 0$$

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

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

$$\sin^2 m = 0 \rightarrow \sin m = 0 \rightarrow m = k\pi$$

$$[0, 2\pi]$$



$$[0, 2\pi]$$

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

(^)

$$\frac{1 - \tan m}{1 + \tan m} = \tan m \rightarrow \frac{\tan \frac{\pi}{4} - \tan m}{1 + \tan \frac{\pi}{4} \tan m} \rightarrow \tan\left(\frac{\pi}{4} - m\right)$$

$$\tan\left(\frac{\pi}{4} - m\right) = \tan m \rightarrow m = k\pi + \frac{\pi}{4} - m$$

$$m = k\pi + \frac{\pi}{4} \rightarrow m = \frac{k\pi}{2} + \frac{\pi}{4}$$

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

(A)

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

(✓)

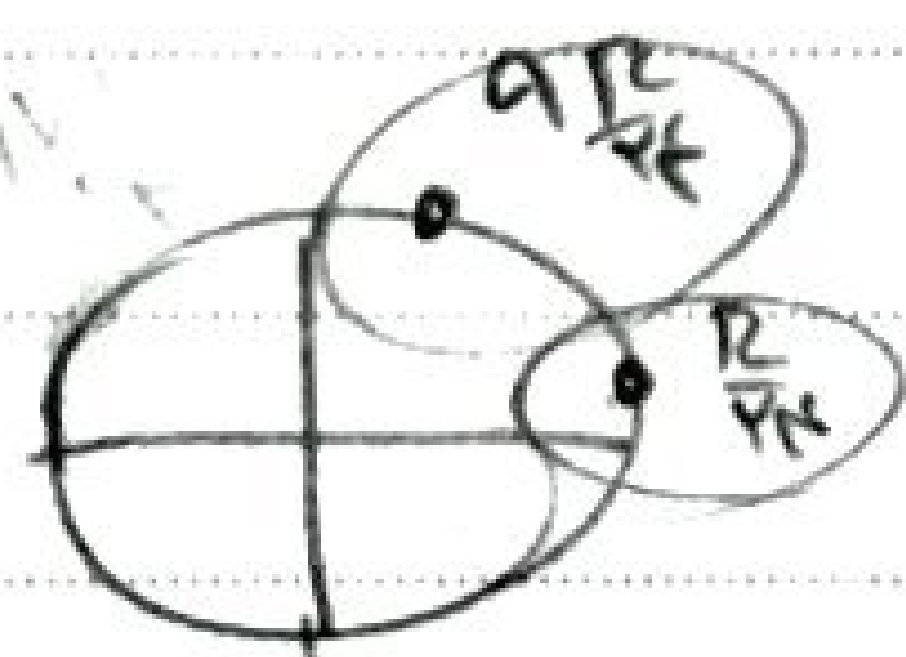
$$\sin m = \cos^2 m \rightarrow \cos^2 m = \cos\left(\frac{\pi}{4} - m\right)$$

$$m = \frac{k\pi}{2} + \frac{\pi}{4}$$

$$\cos^2\left(\frac{\pi}{4} - m\right)$$

$$m = k\pi + \frac{\pi}{4} - m \rightarrow m = k\pi + \frac{\pi}{4}$$

$$m = k\pi - \frac{\pi}{4} \rightarrow m = k\pi - \frac{\pi}{4}$$



جواب

Subject:

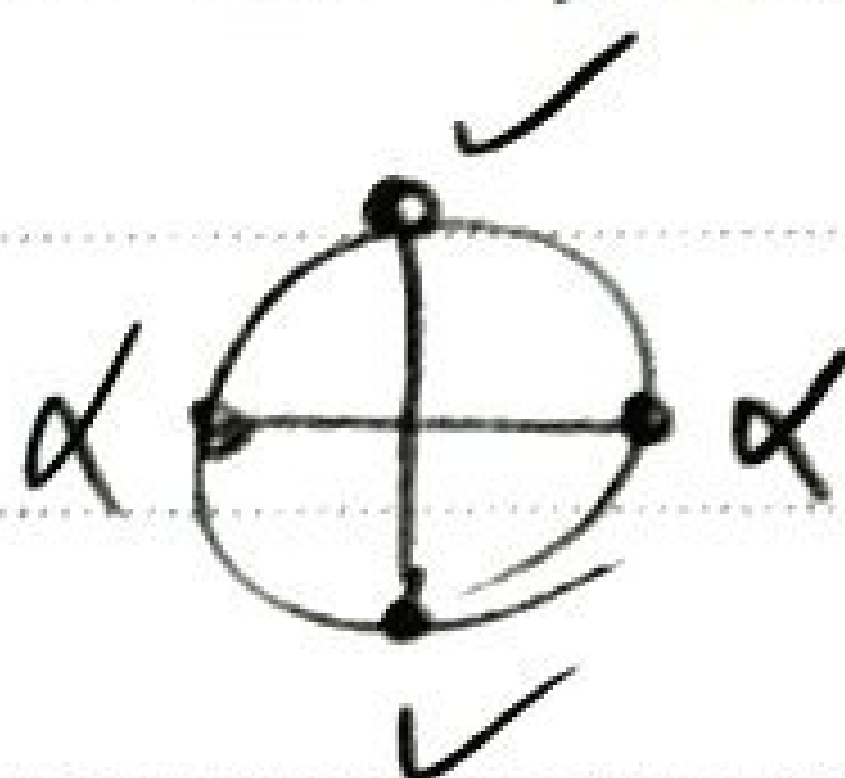
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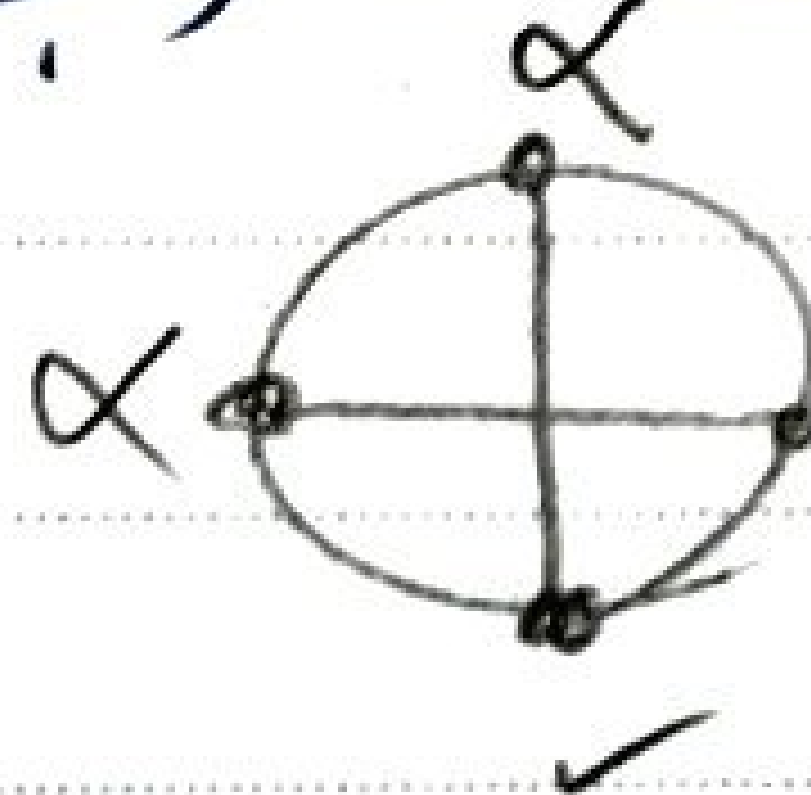
$$\text{الف) } \sin^2 \theta - \cos^2 \theta = 1$$

لا يمكن $\frac{K}{P}$ أن يكون 10


$$\rightarrow [0, 2\pi] \rightarrow \frac{R}{P}, \frac{P}{R}$$

2

$$\text{ب) } \sin^2 \theta - \cos^2 \theta = -1$$


$$\rightarrow [0, 2\pi] \rightarrow 0, \frac{P}{P}, 2\pi$$