

مریم توکلی دوازدهم A صوبہ کھیت ۱۹
 ۱۹، ۷۵ آفرین ضیعی عالی نوشتہ!

(سوال ۱)

الف) $\cos^2 n = 1 - \sin^2 n$

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

$\rightarrow \sin n = \frac{-1 \pm \sqrt{5}}{2}$ $\begin{cases} \sin n = -1 \text{ غلط} \\ \sin n = \frac{1}{2} \text{ حق} \end{cases}$

$\rightarrow \sin n = \frac{1}{2} \rightarrow n \in \boxed{2k\pi + \frac{\pi}{6}}$
 $n \in 2k\pi + \pi - \frac{\pi}{6} \rightarrow \boxed{2k\pi + \frac{5\pi}{6}}$

ب)

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

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

$\rightarrow \cos^2 n + \cos n - 1 = 0 \rightarrow \cos n = \frac{-1 \pm \sqrt{5}}{2}$ $\begin{cases} \cos n = -\frac{1}{2} \text{ غلط} \\ \cos n = 1 \text{ حق} \end{cases}$

$\cos n = 1 \rightarrow \boxed{n \in 2k\pi}$

(سوال ۲)

ج) $\sin^2 n - \cos^2 n = \sin n$

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

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

$\Rightarrow \sin^2 n = \frac{1}{2}$ و $\cos^2 n = 0$

$\rightarrow n \in 2k\pi + \frac{\sqrt{\pi}}{2} \Rightarrow n \in \boxed{k\pi + \frac{\sqrt{\pi}}{2}}$

$\rightarrow n \in 2k\pi + \pi - \frac{\sqrt{\pi}}{2} = 2k\pi - \frac{\sqrt{\pi}}{2} \rightarrow n \in \boxed{k\pi - \frac{\sqrt{\pi}}{2}}$

$\rightarrow n \in 2k\pi + \frac{\pi}{2} \rightarrow n \in \boxed{k\pi + \frac{\pi}{2}}$

آپادانا

$$b) \quad r \cos^2 \theta + r \sin \theta \cos \theta = 1$$

$$\quad \quad \quad \swarrow \quad \searrow$$

$$\quad \quad \quad 1 + \cos^2 \theta \quad \sin \theta$$

$$\rightarrow r + \cos^2 \theta + \sin \theta = 1 \rightarrow \cos^2 \theta + \sin \theta = 0 \Rightarrow \cos^2 \theta = -\sin \theta$$

$$r \rightarrow r \in r k\pi + \frac{r\pi}{\epsilon} \rightarrow \boxed{r \in k\pi + \frac{r\pi}{\epsilon}}$$

$$\quad \quad \quad \rightarrow r \in r k\pi + \frac{r\pi}{\epsilon} \rightarrow \boxed{r \in k\pi + \frac{r\pi}{\epsilon}}$$

(مطلوب)

$$c) \quad \cot \theta (r \cos \theta + 1) = \frac{1}{\sin \theta}$$

$$\rightarrow \frac{\cos \theta}{\sin \theta} (r \cos \theta + 1) = \frac{1}{\sin \theta} = 0 \rightarrow \frac{1}{\sin \theta} (r \cos^2 \theta + \cos \theta - 1) = 0$$

$$\quad \quad \quad \swarrow \quad \searrow$$

$$\quad \quad \quad \cos \theta = -1 + \frac{r}{\epsilon} \quad \cos \theta = -1$$

$$\quad \quad \quad \sin \theta \neq 0 \quad \quad \quad \cos \theta = \frac{1}{r}$$

! $\cos \theta = -1$ و $\sin \theta = 0$ غير مقبول!

$$\cos \theta = \frac{1}{r} \rightarrow \boxed{r \in k\pi + \frac{\pi}{r}}$$

$$b) \quad r \sin^2 \theta - \sin \theta \cos \theta + \cos^2 \theta = r$$

$$\rightarrow \sin^2 \theta + \cos^2 \theta + \sin^2 \theta - \sin \theta \cos \theta = r$$

$$\rightarrow \sin^2 \theta - \sin \theta \cos \theta = \sin^2 \theta + \cos^2 \theta$$

$$\rightarrow \cos^2 \theta + \sin \theta \cos \theta = 0 \Rightarrow \cos \theta (\cos \theta + \sin \theta) = 0$$

$$\quad \quad \quad \downarrow \quad \quad \quad \downarrow$$

$$\cos \theta = 0 \quad \sin \theta = -\cos \theta$$

$$r \rightarrow r \in k\pi + \frac{\pi}{r}$$

$$\quad \quad \quad \rightarrow r \in k\pi + \frac{r\pi}{\epsilon}$$

$$\quad \quad \quad \rightarrow r \in k\pi + \frac{r\pi}{\epsilon}$$

مطلوب

سوال ۴

$$\text{الف) } \cos\left(\frac{\pi}{\varepsilon} + n\right) \cos\left(n - \frac{\pi}{\varepsilon}\right) = \frac{1}{r}$$

$$\rightarrow \cos\left(n - \frac{\pi}{\varepsilon}\right) = \cos\left(\frac{\pi}{\varepsilon} - n\right) \rightarrow \text{دو زاویه متمم یکدیگرند!}$$

$$\rightarrow \frac{\sin\left(n + \frac{\pi}{\varepsilon}\right) \cos\left(n + \frac{\pi}{\varepsilon}\right)}{\frac{1}{r} \sin\left(n + \frac{\pi}{r}\right)} = \frac{1}{\varepsilon} \Rightarrow \frac{\sin\left(n + \frac{\pi}{r}\right)}{\cos n} = \frac{1}{r}$$

$$\rightarrow \cos n = \frac{1}{r} \rightarrow n \in \left\{k\pi + \frac{\pi}{r}\right\} \rightarrow \boxed{n \in k\pi + \frac{\pi}{r}}$$

$$\text{ب) } \cos\left(n - \frac{\pi}{q}\right) = -\sin n$$

$$\rightarrow \cos\left(n - \frac{\pi}{q}\right) = \sin\left(-n\right) = \cos\left(n + \frac{\pi}{r}\right)$$

$$\rightarrow n - \frac{\pi}{q} = k\pi + \frac{\pi}{r} + n \rightarrow \text{غیرممکن}$$

$$\rightarrow n - \frac{\pi}{q} = k\pi - \frac{\pi}{r} - n \Rightarrow \varepsilon n = k\pi - \frac{\pi}{r} + \frac{\pi}{q} \rightarrow \boxed{n \in \frac{k\pi}{r} - \frac{v\pi}{vr}}$$

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

سوال ۵

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

$$\rightarrow r \cos n + 1 = 1 \Rightarrow r \cos n = 0 \Rightarrow \cos n = 0 \rightarrow n \in \left\{k\pi + \frac{\pi}{2}\right\}$$

$$\rightarrow n \in \boxed{k\pi + \frac{\pi}{2}}$$

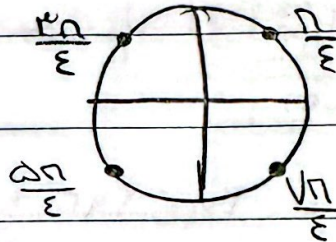
آپادانا

$$\frac{\sin \frac{n}{p}}{1 + \cos \frac{n}{p}} = \frac{1}{\sin \frac{n}{p}} + \cot \frac{n}{p} \left[-\pi, \frac{\pi}{p} \right]$$

(40/سوال)

$$\rightarrow \frac{\sin \frac{n}{p}}{1 + \cos \frac{n}{p}} = \frac{1 + \cos \frac{n}{p}}{\sin \frac{n}{p}} \Rightarrow \tan \frac{n}{\varepsilon} = \frac{1}{\tan \frac{n}{\varepsilon}} \Rightarrow \tan^2 \frac{n}{\varepsilon} = 1$$

$$\rightarrow \tan \frac{n}{\varepsilon} = \pm 1$$



$$\frac{n}{\varepsilon} \in \frac{k\pi}{p} \pm \frac{\pi}{\varepsilon} \rightarrow n \in \{k\pi \pm \pi\}$$

$$\left. \begin{array}{l} -\pi \leq n \leq \frac{\pi}{p} \end{array} \right\} n = -\pi, \pi$$

$$\rightarrow \text{مقادیر} = \boxed{2\pi}$$

$$\underbrace{\cos^2 n - \sin^2 n}_{1 - \sin^2 n} \cos^2 n = 1 \quad [0, \pi]$$

(40/سوال)

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

$$\downarrow \quad \downarrow$$

$$\sin n = 0 \quad \cos^2 n = -1$$

$$n \rightarrow n \in k\pi$$

$$n \in \{k\pi \pm \pi\} \rightarrow n \in \left\{ \frac{k\pi}{p} \pm \frac{\pi}{p} \right\}$$

$$\text{مقادیر} \rightarrow 0, \pi, \frac{\pi}{p}, \frac{3\pi}{p}$$

$$[0, \pi]$$

مقادیر

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

$$\rightarrow \frac{\tan \frac{\pi}{\varepsilon} - \tan \alpha}{1 + (\tan \frac{\pi}{\varepsilon} \times \tan \alpha)} = \tan \alpha \rightarrow \tan(\frac{\pi}{\varepsilon} - \alpha) = \tan \alpha$$

$$\Rightarrow \alpha = k\pi + \frac{\pi}{\varepsilon} - \alpha \Rightarrow \varepsilon \alpha = k\pi + \frac{\pi}{\varepsilon}$$

$$\Rightarrow \alpha \in \left[\frac{k\pi}{\varepsilon} + \frac{\pi}{14} \right]$$

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

$$\rightarrow \cos \alpha > 0 \rightarrow 1 + \sin^2 \alpha = 2 \frac{\cos^2 \alpha}{(1 - \sin^2 \alpha)}$$

1, 1/2

$$\rightarrow 1 + \sin^2 \alpha = 2 - 2 \sin^2 \alpha \rightarrow 3 \sin^2 \alpha - 1 = 0$$

$$\sin^2 \alpha = \frac{-1 \pm \sqrt{2}}{3} \quad \begin{cases} \sin \alpha = 1 \rightarrow \alpha \in k\pi + \frac{\pi}{2} \leq k\pi - \frac{\pi}{2} \\ \sin \alpha = \frac{1}{\sqrt{3}} \rightarrow \alpha \in k\pi + \frac{\pi}{6} \leq k\pi + \frac{5\pi}{6} \end{cases}$$

$$\alpha \in k\pi + \frac{\pi}{6} / k\pi - \frac{\pi}{6} / k\pi + \frac{\pi}{12} / k\pi + \frac{5\pi}{12}$$

$$\rightarrow \frac{\pi}{6}, \frac{\pi}{12}, \frac{5\pi}{12} \Rightarrow \boxed{\text{جواب}} \quad \text{برای } x = \frac{5\pi}{12} \text{ قسم مشروطین جواب را بیاد است نمودات}$$

$$\text{جواب: } \sin^2 \alpha - \cos^2 \alpha = 1 \quad [0, \pi]$$

$$-\cos^2 \alpha \rightarrow -\cos^2 \alpha = 1 \rightarrow \cos^2 \alpha = -1 \rightarrow \alpha \in k\pi + \pi$$

$$\rightarrow \alpha \in k\pi + \frac{\pi}{2} \Rightarrow \boxed{\frac{\pi}{2}, \frac{3\pi}{2}}$$

* مقایسه کنید، اکتفا من نیست.

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

$$\alpha = 0 \rightarrow 0 - 1 = -1 \quad \alpha = \pi \rightarrow 0 - (-1) = -1 \quad \alpha = k\pi \rightarrow 0 - 1 = -1$$

$$\alpha = \frac{\pi}{2} \rightarrow 1 - 0 = 1 \quad \alpha = \frac{3\pi}{2} \rightarrow -1 - 0 = -1 \Rightarrow \boxed{\frac{\pi}{2}, \frac{3\pi}{2}}$$

آپادانا

سوال 9

$$\sqrt{1 + \sin 2x} = \sqrt{2} \cos x \xrightarrow{\text{توان 2}} 1 + \sin 2x = 2 \cos^2 x$$

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

$$\sin 2x = -1 \rightarrow 2x \in k\pi - \frac{\pi}{2} \xrightarrow[k < 1]{0 \leq x \leq \pi} x = \frac{3\pi}{4} \checkmark$$

$$\sin 2x = \frac{1}{2} \rightarrow 2x \in k\pi + \frac{\pi}{6} \cup k\pi + \frac{5\pi}{6} \xrightarrow[k \geq 0]{0 \leq x \leq \pi} x = \frac{\pi}{12} \cup \frac{5\pi}{12} \checkmark$$

چون عبارت به توان 2 رسیده است جواب زاویه تولید می کنند
به ازای $x = \frac{5\pi}{12}$ $\cos x$ منفی می شود پس این جواب را می باید است حذف کرد

* معادله 2 جواب دارد