

$$\lambda \cos x - \tan^2 x = 1 \rightarrow \lambda \cos x = 1 + \tan^2 x \rightarrow \lambda \cos x = \frac{1}{\cos^2 x} \rightarrow \cos^3 x = \frac{1}{\lambda}$$

$$\rightarrow \boxed{\cos x = \frac{1}{\lambda}} \rightarrow \text{دایره: } [0, 2\pi] \text{ جواب: } \checkmark$$

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$$\begin{aligned} 8 \sin^2 x + 2 \cos^3 x &= -2 \rightarrow 8 - 8 \cos^2 x + \lambda \cos^3 x - 4 \cos x + 2 = 0 \\ \rightarrow \lambda \cos^3 x - 8 \cos^2 x - 4 \cos x + 10 &= 0 \rightarrow (\cos x + 1)(\lambda \cos^2 x - 13 \cos x + 7) = 0 \\ \boxed{\cos x = -1} & \quad \text{فاکتورگیری} \end{aligned}$$

$$[-\pi, \pi] \text{ جواب: } \checkmark$$

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$$\begin{aligned} 2 \sin x \cos^2 x + \sin x &= 1 \rightarrow \sin x (2 \cos^2 x + 1) = 1 \rightarrow \sin x (-2 \sin^2 x + 3) = 1 \\ \rightarrow 2 \sin^3 x - 3 \sin x + 1 &= 0 \rightarrow (\sin x + 1)(2 \sin^2 x - 5 \sin x + 1) = 0 \rightarrow (\sin x + 1)(2 \sin x - 1) = 0 \end{aligned}$$

$$\left. \begin{aligned} \sin x &= -1 \\ \sin x &= \frac{1}{2} \end{aligned} \right\} \text{دایره: } [0, 2\pi] \quad \frac{\pi}{4} + \frac{8\pi}{4} + \frac{3\pi}{4} = \frac{11\pi}{4} = \frac{\Delta\pi}{4} \quad \checkmark$$

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$$\frac{1}{\sin(\frac{\pi+8x}{4})} + \frac{1}{\cos(\frac{\pi+4x}{4})} = \frac{1}{\cos 2x} + \frac{1}{-\sin 2x} = \frac{2 \sin 2x - 1}{2 \sin 2x \cos 2x} = 0$$

$$\sin 2x = \frac{1}{2} \rightarrow \left. \begin{aligned} 2x &= 2k\pi + \frac{\pi}{6} \rightarrow x = k\pi + \frac{\pi}{12} \\ 2x &= 2k\pi + \frac{5\pi}{6} \rightarrow x = k\pi + \frac{5\pi}{12} \end{aligned} \right\} \text{دایره: } [0, \pi] \quad \frac{\Delta\pi}{12}, \frac{\pi}{12}$$

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$$2\alpha = \left(\frac{5\pi}{12} - \frac{\pi}{12}\right) \times 2 = \frac{2\pi}{3} \quad \tan\left(\frac{2\pi}{3}\right) = -\sqrt{3} \quad \checkmark$$

$$\begin{aligned} m(\cos x - \sin x) - 3\sqrt{4} \sin 2x &= \sqrt{4} \rightarrow \frac{\sqrt{2}m}{\sqrt{2}} - 3\sqrt{4} \sin 2x = \sqrt{4} \\ \frac{\sqrt{2}m}{\sqrt{2}} &= 2\sqrt{4} \rightarrow m = 4 \end{aligned}$$

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$$\sin\left(x + \frac{\pi}{2}\right) = \frac{\sqrt{2}}{\sqrt{3}}$$

$$\frac{\sqrt{2}}{\sqrt{3}}(\sin x + \cos x) = \frac{\sqrt{2}}{\sqrt{3}} \rightarrow \sin^2 x + \cos^2 x + \sin 2x = \frac{2}{\sqrt{3}} \rightarrow \sin 2x = \frac{1}{\sqrt{3}}$$

$$\sin\left(x + \frac{\pi}{4}\right) \cos\left(x - \frac{\pi}{4}\right) = 1 \Rightarrow \sin^2\left(x + \frac{\pi}{4}\right) = 1 \rightarrow \sin\left(x + \frac{\pi}{4}\right) = \pm 1$$

$$\frac{\cos\left(\frac{\pi}{4} - x\right)}{\sin\left(x + \frac{\pi}{4}\right)}$$

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

$$\frac{\text{دوره}}{[0, 2\pi]} \rightarrow \text{جواب} \checkmark$$

$$\sin x + \sqrt{3} \cos x = \sqrt{2} \rightarrow \sqrt{1^2 + (\sqrt{3})^2} \sin\left(x + \frac{\pi}{6}\right) = \sqrt{2} \rightarrow \sin\left(x + \frac{\pi}{6}\right) = \frac{\sqrt{2}}{2}$$

$$\sqrt{2} = 2$$

سوال مقبرع جواب هارا من خواهد

$$k=0 \rightarrow x = -\frac{\pi}{6}$$

$$k=1 \rightarrow x = \frac{\pi}{6}$$

$$x + \frac{\pi}{6} = 2k\pi + \frac{\pi}{2} \rightarrow x = 2k\pi + \frac{\pi}{3}$$

$$x + \frac{\pi}{6} = 2k\pi + \frac{3\pi}{2} \rightarrow x = 2k\pi + \frac{5\pi}{3}$$

$$k=0 \rightarrow x = \frac{5\pi}{3}$$

$$\rightarrow S = \left(\frac{2\pi + 4 - 1}{12}, n\right) = \frac{2\pi n}{12} = \frac{\pi n}{6}$$

$$\sin x \sin\left(\frac{5\pi}{4} - x\right) = 1 \rightarrow \sin 2x = -\frac{1}{2}$$

$$2x = 2k\pi - \frac{\pi}{4} \rightarrow x = k\pi - \frac{\pi}{8}$$

$$2x = 2k\pi - \frac{3\pi}{4} \rightarrow x = k\pi - \frac{3\pi}{8}$$

$$\left\{ \begin{array}{l} \text{دوره} \\ [-\pi, 2\pi] \end{array} \right\} \frac{5\pi}{12}, \frac{11\pi}{12}, \frac{19\pi}{12}, \frac{25\pi}{12}$$

$$\text{مجموع جواب ها} \rightarrow 8\pi$$

$$(1 + \cos(2\alpha))(1 + \cos(4\alpha))(1 + \cos(8\alpha)) = \frac{1}{\lambda} \rightarrow \lambda \cos^2 \alpha \cos^2 2\alpha \cos^2 4\alpha = \frac{1}{\lambda}$$

$$|\cos \alpha \cos 2\alpha \cos 4\alpha| = \frac{1}{\lambda} \rightarrow \left| \frac{\sin 8\alpha}{\lambda \sin \alpha} \right| = \frac{1}{\lambda} \rightarrow |\sin 8\alpha| = |\sin \alpha|$$

$$\text{مجموع جواب ها} = \frac{4\pi}{\lambda}$$

$$\sin 8\alpha = \sin \alpha \rightarrow 8\alpha = 2k\pi + \alpha \rightarrow \alpha = \frac{7k\pi}{7}$$

$$\rightarrow \frac{7\pi}{7}, \frac{14\pi}{7}, \frac{21\pi}{7}, \frac{28\pi}{7}, \frac{35\pi}{7}, \frac{42\pi}{7}, \frac{49\pi}{7}$$

$$\sin 8\alpha = \sin -\alpha \rightarrow 8\alpha = 2k\pi - \alpha \rightarrow \alpha = \frac{7k\pi}{9}$$

$$\rightarrow \frac{7\pi}{9}, \frac{14\pi}{9}, \frac{21\pi}{9}, \frac{28\pi}{9}, \frac{35\pi}{9}, \frac{42\pi}{9}, \frac{49\pi}{9}$$

$$\tan^3 x \times \tan x = 1 \xrightarrow{\tan x = t} \frac{t^3 - t^6}{1 - t^6} \times t = 1 \rightarrow t^6 - 4t^3 + 1 = 0 \rightarrow \tan x = \pm \sqrt{3 \pm 2\sqrt{2}}$$

$$\tan x = \pm \tan \frac{\pi}{4} \rightarrow x = k\pi \pm \frac{\pi}{4}$$

$$\tan x = \pm \tan \frac{5\pi}{4} \rightarrow x = k\pi \pm \frac{5\pi}{4}$$

$$\left\{ \begin{array}{l} \text{دوره} \\ [0, 2\pi] \end{array} \right\} \frac{9\pi}{4}, \frac{11\pi}{4}, \frac{13\pi}{4}, \frac{15\pi}{4}$$

$$\text{مجموع جواب ها} = 4\pi$$