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امیر کاشف

۱۹/۵ آفرین

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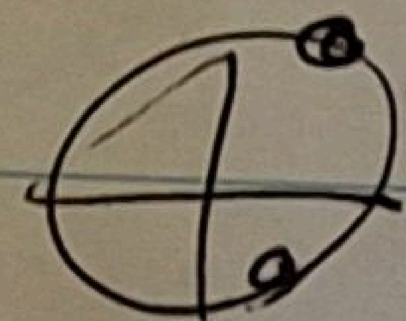
$8\cos x - \tan^2 x = 1 \Rightarrow 8\cos x = 1 + \tan^2 x \Rightarrow 8\cos x = \frac{1}{\cos^2 x}$

$8\cos^3 x = 1 \Rightarrow \cos^3 x = \frac{1}{8} \Rightarrow \cos x = \frac{1}{2}$



$x = 2k\pi + \frac{\pi}{3} \xrightarrow{k=0} x = \frac{\pi}{3}$

$x = 2k\pi + \frac{5\pi}{3} \xrightarrow{k=0} x = \frac{5\pi}{3}$

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$5\sin^2(x) + 2\cos(3x) = -2 \Rightarrow 5(1-\cos^2 x) + 2(4\cos^3 x - 3\cos x) = -2$

$\Rightarrow 5 - 5\cos^2 x + 8\cos^3 x - 6\cos x = -2 \Rightarrow \underbrace{(8\cos^2 x - 13\cos x + 7)}_{\text{بدون جواب}}(\cos x + 1) = 0$

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$\cos x = -1 \Rightarrow \boxed{x = \pi}$

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$2\sin(x)\cos(2x) + \sin(x) = 1 \Rightarrow 2\sin x(1 - 2\sin^2 x) + \sin x = 1$

$3\sin x - 4\sin^3 x - 1 = 0 \xrightarrow{\sin x = -1 \ \text{صدق می‌کند}} (\sin x + 1)\underbrace{(-4\sin^2 x + 4\sin x - 1)}_{-(2\sin x - 1)^2} = 0$

$\sin x = -1 \Rightarrow x = \frac{3\pi}{2}$

$\sin x = \frac{1}{2} \Rightarrow x = \frac{\pi}{6}$, $x = \frac{5\pi}{6}$

۳ جواب

مجموع $\frac{5\pi}{2}$

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

$$\cos 2x=\sin 4x$$

$$\cos 2x=\cos(\frac{\pi}{2}-4x)$$

$$2k\pi+\frac{\pi}{2}-4x=2x \Rightarrow x=\frac{k\pi}{3}+\frac{\pi}{12}$$

$$2k\pi-\frac{\pi}{2}+4x=2x \Rightarrow x=k\pi+\frac{\pi}{4}$$

$\frac{\pi}{12}, \frac{9\pi}{12}, \frac{\pi}{4} \to \Delta=\frac{\pi}{3}$

$\tan\frac{\pi}{3}=\sqrt{3}$

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$$m(\cos x-\sin x)-3\sqrt{6}\sin(2x)=\sqrt{6} \qquad \cos(x+\frac{\pi}{4})=\frac{1}{\sqrt{3}} \qquad m?$$

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$$\frac{\sqrt{2}}{2}(\cos x-\sin x)=\frac{1}{\sqrt{3}}$$

$$\cos x-\sin x=\sqrt{\frac{2}{3}} \qquad \sin 2x=1-(\cos x-\sin x)^2=\frac{1}{3} \Rightarrow$$

$m=6$

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$$\sin(x+\frac{\pi}{6})\cos(x-\frac{\pi}{3})=1$$

$$\cos(\frac{\pi}{2}-x-\frac{\pi}{6})=\cos(\frac{\pi}{3}-x) \quad \Rightarrow \cos^2(x-\frac{\pi}{3})=1$$

دو جواب

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$$\cos(x-\frac{\pi}{3})=\pm 1 \to 2k\pi=x-\frac{\pi}{3}$$

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

$x=\frac{\pi}{3}$ $\quad x=\frac{4\pi}{3}$

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$$\sin x+\sqrt{3}\cos x=\sqrt{2} \Rightarrow 2\sin(\frac{\pi}{3}+x)=\sqrt{2}$$

$$\sin(x+\frac{\pi}{3})=\sin\frac{\pi}{4} \to 2k\pi+\frac{\pi}{4}=x+\frac{\pi}{3} \Rightarrow x=2k\pi-\frac{\pi}{12}$$

$$2k\pi+\frac{3\pi}{4}=x+\frac{\pi}{3} \to x=2k\pi+\frac{5\pi}{12}$$

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جواب‌ها $\Rightarrow -\frac{\pi}{12}, \frac{5\pi}{12}, \frac{23\pi}{12} \xrightarrow{\text{جمع}} \frac{9\pi}{4}$

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$4\sin x \sin\left(\frac{3\pi}{2} - x\right) = 1$ ۱،۵ ۸

$\underbrace{\sin\left(\frac{3\pi}{2} - x\right)}_{-\cos x} \Rightarrow -4\sin x\cos x = 1 \Rightarrow \sin 2x = -\frac{1}{2}$

$2x = 2k\pi + \frac{5\pi}{6} \Rightarrow x = k\pi + \frac{5\pi}{12} \Rightarrow x = \frac{5\pi}{12}, \frac{17\pi}{12}$

$2x = 2k\pi + \frac{7\pi}{6} \Rightarrow x = k\pi + \frac{7\pi}{12} \Rightarrow x = \frac{7\pi}{12}, \frac{19\pi}{12}$ } جمع 4π

$\underbrace{(1+\cos(2\alpha))}_{2\cos^2\alpha}\underbrace{(1+\cos(4\alpha))}_{2\cos^2 2\alpha}\underbrace{(1+\cos(8\alpha))}_{2\cos^2 4\alpha} = \frac{1}{8}$ ۹

$\Rightarrow \cos^2\alpha\cos^2 2\alpha\cos^2 4\alpha = \frac{1}{64} \xrightarrow{\times\frac{\sin^2\alpha}{\sin^2\alpha}} \frac{\sin^2 8\alpha}{\sin^2\alpha} = 1$

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$\sin^2 8\alpha = \sin^2\alpha$

$k = 7$

$\alpha = \frac{8\pi}{9}$

$\tan(3x)\tan(x) = 1$ ۱۰

$\frac{\sin 3x \sin x}{\cos x \cos 3x} = 1 \Rightarrow \cos 3x\cos x - \sin 3x\sin x = \cos 4x = 0$

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$x = \frac{k\pi}{4} + \frac{\pi}{8} = \left(\frac{2k+1}{8}\right)\pi$ $x \to \frac{9\pi}{8}, \frac{13\pi}{8}, \frac{11\pi}{8}, \ldots$

6π جمع

iman NOTEBOOK

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$$\sin\left(\frac{۳\pi}{۲}-x\right)=-\cos x$$

$$۴\sin x(-\cos x)=۱ \longrightarrow -۲(۲\sin x\cos x)=۱ \longrightarrow \sin ۲x=-\frac{۱}{۲}$$

$$۲x=۲k\pi-\frac{\pi}{۶} \text{ یا } ۲k\pi+\frac{۷\pi}{۶} \longrightarrow x=\overset{2}{k\pi-\frac{\pi}{۱۲}} \text{ یا } \overset{1}{k\pi+\frac{۷\pi}{۱۲}}$$

$$\xrightarrow{۰\leq x\leq ۲\pi} \begin{cases} 1\quad k=۰\,,۱ \longrightarrow x=\frac{۷\pi}{۱۲}\,,\ \frac{۱۹\pi}{۱۲} \\ 2\quad k=۱\,,۲ \longrightarrow x=\frac{۱۱\pi}{۱۲}\,,\ \frac{۲۳\pi}{۱۲} \end{cases}$$

$$S=\frac{۷\pi}{۱۲}+\frac{۱۹\pi}{۱۲}+\frac{۱۱\pi}{۱۲}+\frac{۲۳\pi}{۱۲}=\frac{۶۰\pi}{۱۲}=\boxed{۵\pi}$$