نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره ..۱۷.. کلاس ...ریاضی ۸...

۱۴٫۵

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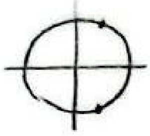
$8\cos\alpha = 1+\tan^2\alpha = \frac{1}{\cos^2\alpha}$

$8 = \frac{1}{\cos^3\alpha}$ $(\cos\alpha \neq 0) \longrightarrow \cos\alpha = \frac{1}{2}$



۲ جواب

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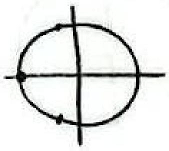
$5\sin^2x + 2\cos 3x = -2 \rightarrow 5(1-\cos^2x) + 2(4\cos^3x - 3\cos x) = -2$

$\rightarrow 8\cos^3x - 5\cos^2x - 6\cos x + 7 = 0 \rightarrow (\cos x + 1)(8\cos^2x - 13\cos x - 7) = 0$

$\cos x = -1$

$\cos x = \frac{13+\sqrt{393}}{16} = \frac{32.5}{16} \simeq 2$

$\cos x = \frac{13-\sqrt{393}}{16} = \frac{-6}{16} = -\frac{3}{8}$



۳ جواب

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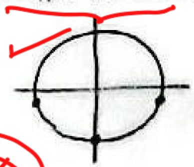
$\sin x\,(2\cos 2x + 1) = 1 \longrightarrow \sin x\,(2 - 4\sin^2x + 1) = 1 \rightarrow 3\sin x - 4\sin^3x = 1$

$\rightarrow 4\sin^3x - 3\sin x + 1 = 0 \longrightarrow \begin{cases} \sin x = -1 \\ \sin x = \frac{1+\sqrt{2}}{2} \simeq 1.25 \\ \sin x = \frac{1-\sqrt{2}}{2} \simeq -0.25 \end{cases}$

$(t+1)(4t^2 - 4t - 1) = 0$

$t = -1 \qquad t = \frac{1\pm\sqrt{2}}{2}$



۳ جواب

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پایین صفحه مطالعه شود.

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

$4x = 2k\pi + \frac{\pi}{2} - 2x \longrightarrow x = \frac{k\pi}{3} + \frac{\pi}{12} \longrightarrow \frac{\pi}{12}, \frac{5\pi}{12}$

$\alpha = \cancel{\frac{\pi}{6}}$ $\quad \frac{\pi}{3}$

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

$\tan 2\alpha = \cancel{\tan\frac{\pi}{3} = \sqrt{3}}$

$\tan(\frac{2\pi}{3}) = -\sqrt{3}$

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$\cos(x + \frac{\pi}{4}) = \frac{\sqrt{2}}{2}\cos x - \frac{\sqrt{2}}{2}\sin x = \frac{\sqrt{3}}{3} \rightarrow \cos x - \sin x = \frac{\sqrt{6}}{3}$

$\frac{\sqrt{6}}{3}m - 3\sqrt{6}\sin 2x = \sqrt{6} \longrightarrow m - 9\sin 2x = 1 \longrightarrow \frac{m-1}{9} = \sin 2x = \frac{1}{3} \longrightarrow \boxed{m = 4}$

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

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$\frac{\sqrt{6}}{3}m - 3\sqrt{6} \times \frac{1}{3} = \sqrt{6}$

$\rightarrow m = 6$

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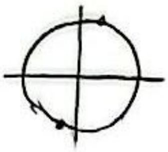
$$\begin{cases}\sin(x+\frac{\pi}{6})\cos(\frac{\pi}{3}-x)=1\\ \sin(x+\frac{\pi}{6})\sin(x+\frac{\pi}{6})=1\end{cases} \longrightarrow \begin{cases}\sin(x+\frac{\pi}{6})=1 \to x+\frac{\pi}{6}=2k\pi+\frac{\pi}{2}\\ \sin(x+\frac{\pi}{6})=-1 \to x+\frac{\pi}{6}=2k\pi+\frac{3\pi}{2}\end{cases}$$

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

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



۲ جواب

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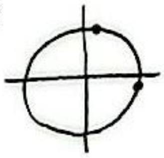
$$\frac{1}{2}\sin x+\frac{\sqrt{3}}{2}\cos x=\frac{\sqrt{2}}{2} \longrightarrow \sin(x+\frac{\pi}{3})=\sin\frac{\pi}{4}$$

$$x+\frac{\pi}{3}=2k\pi+\frac{\pi}{4} \to x=2k\pi-\frac{\pi}{12} \to -\frac{\pi}{12} \quad \frac{23\pi}{12}$$

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



$$-\frac{\pi}{12}+\frac{5\pi}{12}+\frac{23\pi}{12}=\frac{27\pi}{12}=\boxed{\frac{9\pi}{4}}$$

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$$-4\sin x\cos x=1 \longrightarrow \sin 2x=-\frac{1}{2}$$

$$2x=2k\pi+\frac{7\pi}{6} \to x=k\pi+\frac{7\pi}{12} \to \frac{7\pi}{12} \quad \frac{19\pi}{12}$$

$$2x=2k\pi+\frac{11\pi}{6} \to x=k\pi+\frac{11\pi}{12} \to \frac{11\pi}{12} \quad \frac{23\pi}{12}$$

$$\frac{11\pi}{12}+\frac{23\pi}{12}+\frac{7\pi}{12}+\frac{19\pi}{12}=\frac{60\pi}{12}=\boxed{5\pi}$$

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

$$\frac{2\sin^2\alpha}{2\sin^2\alpha}\times 2\cos^2\alpha\times 2\cos^2 2\alpha\times 2\cos^2 4\alpha=\frac{1}{8} \quad \frac{\sin^2 8\alpha}{\sin^2\alpha}=\frac{1}{8} \longrightarrow \sin^2 8\alpha=\sin^2\alpha$$

$$\to \begin{cases}\sin 8\alpha=\sin\alpha \longrightarrow & 8\alpha=2k\pi+\alpha \longrightarrow \alpha=\frac{2k\pi}{7} \longrightarrow 0 \quad \frac{2\pi}{7} \quad \frac{4\pi}{7} \quad \frac{6\pi}{7}\\ & 8\alpha=2k\pi+\pi-\alpha \longrightarrow \alpha=\frac{2k\pi}{9}+\frac{\pi}{9} \longrightarrow \frac{\pi}{9} \quad \frac{3\pi}{9} \quad \frac{5\pi}{9} \quad \frac{7\pi}{9} \quad \pi\\ \sin 8\alpha=\sin(-\alpha) \to & 8\alpha=2k\pi-\alpha \longrightarrow \alpha=\frac{2k\pi}{9} \to 0 \quad \frac{2\pi}{9} \quad \frac{4\pi}{9} \quad \frac{6\pi}{9} \quad \frac{8\pi}{9}\\ & 8\alpha=2k\pi+\pi+\alpha \longrightarrow \alpha=\frac{2k\pi}{7}+\frac{\pi}{7} \to \frac{\pi}{7} \quad \frac{3\pi}{7} \quad \frac{5\pi}{7} \quad \pi\end{cases}$$

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$\boxed{\max A=\pi}$

نمی‌تواند π باشد چون $\sin\alpha\neq 0$ است.

max A

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$$\tan 3x=\cot x=\tan(\frac{\pi}{2}-x)$$

$$3x=2k\pi+\frac{\pi}{2}-x \to x=\frac{k\pi}{4}+\frac{\pi}{8} \longrightarrow \frac{9\pi}{8} \quad \frac{13\pi}{8}$$

$$\cancel{3x=2k\pi-\frac{\pi}{2}+x \to x=k\pi-\frac{\pi}{4} \longrightarrow \frac{7\pi}{4}}$$

$$\frac{15\pi}{8}+\frac{9\pi}{8}+\frac{11\pi}{8}+\frac{13\pi}{8}=\frac{36\pi}{8}=\boxed{\cancel{\frac{9\pi}{2}}} \quad 6\pi$$

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

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

$$5\sin^2 x + 2\left(2\cos^2\frac{3x}{2} - 1\right) = -2$$

$$5\sin^2 x + 4\cos^2\frac{3x}{2} = 0$$

دوعبارت نامنفی صفراست . پس هرکدام صفراست .

$$4\cos^2\frac{3x}{2} = 0 \longrightarrow x = -\pi, \frac{\pi}{3}, -\frac{\pi}{3}, \pi$$

$$5\sin^2 x = 0 \longrightarrow -\pi, 0, \pi$$

$$\{-\pi, \pi\}$$

دوجواب

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

$$\underbrace{-4\sin^3 x + 3\sin x}_{} = 1$$

$$\sin 3x = 1 \longrightarrow x = \frac{2k\pi}{3} + \frac{\pi}{6}$$

$$x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{9\pi}{6} \xrightarrow{\text{جمع}} \frac{5\pi}{2}$$