نام و نام خانوادگی [illegible] ...... پاسخنامه تشریحی تکلیف شماره .... کلاس ...... دوازدهم B

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الف) $\cos 2x = 3\sin x - 1 \longrightarrow 1 - 2\sin^2 x = 3\sin x - 1 \longrightarrow 2\sin^2 x + 3\sin x - 2 = 0$

$\sin x = -2$ ✗

$\sin x = \frac{1}{2}$ ✓ $\longrightarrow \sin x = \sin\frac{\pi}{6} \longrightarrow \boxed{x = 2k\pi + \frac{\pi}{6} \;,\; x = 2k\pi + \frac{5\pi}{6}}$

ب) $\cos 2x + \cos x - 2 = 0 \longrightarrow 2\cos^2 - 1 + \cos x - 2 = 0 \longrightarrow \cos x = 1 \;,\; \cos x = -\frac{3}{2}$ ✗

$\cos x = 1 \longrightarrow \boxed{x = 2k\pi}$

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$\sin^4 - \cos^4 = \sin 4x \longrightarrow (\sin^2 - \cos^2)(\underbrace{\sin^2 + \cos^2}_{1}) = \sin 4x$

$\longrightarrow -\cos 2x = \sin 4x \rightarrow \underbrace{\sin 4x}_{2\cos 2x \sin 2x} + \cos 2x = 0 \rightarrow \cos 2x(2\sin 2x + 1) = 0 \rightarrow \cos 2x = 0$

$2x = k\pi + \frac{\pi}{2} \rightarrow \boxed{x = \frac{k\pi}{2} + \frac{\pi}{4}}$ و $\sin 2x = -\frac{1}{2} \rightarrow 2x = 2k\pi - \frac{\pi}{6} \rightarrow \boxed{x = k\pi - \frac{\pi}{12}}$

$2x = 2k\pi - \frac{5\pi}{6} \rightarrow \boxed{x = k\pi - \frac{5\pi}{12}}$

ب) $2\cos^2 x + 2\sin x\cos x = 1 \rightarrow \underbrace{2\cos^2 - 1}_{\cos 2x} + \underbrace{2\sin x\cos x}_{\sin 2x} = 0 \rightarrow \sqrt{2}\sin(2x + \frac{\pi}{4}) = 0$

$\rightarrow \sin(2x + \frac{\pi}{4}) = 0 \quad 2x + \frac{\pi}{4} = k\pi \rightarrow \boxed{x = \frac{k\pi}{2} - \frac{\pi}{8}}$

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الف) $\cot x(2\cos x + 1) = \frac{1}{\sin x} \xrightarrow[\times \sin x]{\sin x \neq 0} \cos(2\cos + 1) = 1 \rightarrow 2\cos^2 + \cos - 1 = 0$

$\cos = -1 \rightarrow \sin x = 0 \rightarrow$ ✗

$\cos = \frac{1}{2} \rightarrow \boxed{x = 2k\pi \pm \frac{\pi}{3}}$

ب) $2\sin^2 x - \sin x\cos x + \cos^2 x = 2 \xrightarrow{\div \sin^2 x} 2 - \cot x + \cot^2 x = 2\underbrace{\frac{1}{\sin^2}}_{(1+\cot^2 x)}$

$\rightarrow \cot^2 x + \cot x = 0 \rightarrow \cot x(\cot x + 1) = 0 \rightarrow \cot x = 0 \quad \boxed{x \in k\pi + \frac{\pi}{2}}$

$\cot x = -1 \rightarrow \boxed{x = k\pi - \frac{\pi}{4}}$

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الف) $\cos(\frac{\pi}{4} + x)\underbrace{\cos(x - \frac{\pi}{4})}_{\cos(\frac{\pi}{4} - x)} = \frac{1}{4} \rightarrow \underbrace{\cos(x + \frac{\pi}{4})\sin(x + \frac{\pi}{4})}_{\frac{\sin(2x + \frac{\pi}{2})}{2}} = \frac{1}{4} \rightarrow \cos 2x = \frac{1}{2}$

متمم

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

ب) $\cos(2x - \frac{\pi}{9}) = -\sin 2x = \sin(-2x) = \cos(\frac{3\pi}{2} - 2x) \rightarrow 2x - \frac{\pi}{9} = 2k\pi + \frac{3\pi}{2} - 2x$

$2x - \frac{\pi}{9} = 2k\pi - \frac{3\pi}{2} + 2x$ ✗

$4x = 2k\pi + \frac{3\pi}{2} + \frac{\pi}{9} \rightarrow x = \frac{k\pi}{2} + \frac{29\pi}{72}$

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$\frac{\sin 4x + \sin 2x}{\sin 2x} - \sin^2 x = \cos^2 x \rightarrow \frac{\cancel{\sin 2x}(2\cos 2x + 1)}{\cancel{\sin 2x}} = 1 \quad (\sin^2 + \cos^2 = 1)$

$\longrightarrow \sin 2x \neq 0$

$2\cos 2x + 1 = 1 \longrightarrow \cos 2x = 0 \quad 2x = k\pi + \frac{\pi}{2} \rightarrow x = \frac{k\pi}{2} + \frac{\pi}{4}$

$\sin 2x \neq 0 \longrightarrow 2x \neq k\pi \rightarrow x \neq \frac{k\pi}{2} \longrightarrow$ ج. $\boxed{x = \frac{k\pi}{2} + \frac{\pi}{4}}$

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$\frac{\sin\frac{x}{4}}{1+\cos\frac{x}{4}} = \frac{1}{\sin\frac{x}{4}} + \underbrace{\cot\frac{x}{4}}_{\frac{\cos\frac{x}{4}}{\sin\frac{x}{4}}} \to \frac{\sin\frac{x}{2}}{1+\cos\frac{x}{2}} = \tan\left(\frac{x/2}{2}\right) = \tan\left(\frac{x}{4}\right)$

$\frac{1+\cos\frac{x}{2}}{\sin\frac{x}{2}} = \frac{1}{\tan\frac{x}{4}} = \cot\frac{x}{4}$

$\to \tan\frac{x}{4} = \cot\frac{x}{4} = \tan\left(\frac{\pi}{2}-\frac{x}{4}\right) \to \frac{x}{4} = k\pi + \frac{\pi}{2} - \frac{x}{4} \to \frac{x}{2} = k\pi + \frac{\pi}{2} \to x = 2k\pi + \pi$

$\left[-\pi, \frac{3\pi}{2}\right]$ $\quad -\pi, \pi \to$ اختلاف $\pi-(-\pi) = 2\pi$

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$\cos^2 x - \sin^2 x \underbrace{\cos 3x}_{4\cos^3 x - 3\cos x} = 1 \to \cancel{\cos^2} - (4\cos^3 x \sin^2 x - 3\sin^2 x\cos x) = 1 = \sin^2 + \cancel{\cos^2}$

$\to \sin^2 x + 4\cos^3 x \sin^2 x - 3\sin^2 x \cos x = 0 \to \sin^2 x(4\cos^3 x - 3\cos x + 1) = 0$

$\sin^2 x = 0 \to \boxed{x = k\pi} \to 0, \pi, 2\pi$

$\cos x = -1 \to \boxed{x = 2k\pi + \pi} \to \pi \to$ مضاعف

$(\cos x+1)(4\cos^2 x - 4\cos x + 1)$

$(2\cos - 1)^2$

$\cos = \frac{1}{2} \to x = \boxed{2k\pi \pm \frac{\pi}{3}} \to \frac{\pi}{3} \quad \frac{5\pi}{3}$

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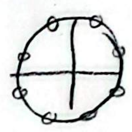
$\underbrace{\frac{1-\tan x}{1+\tan x}}_{\tan\left(\frac{\pi}{4}-x\right)} = \tan 3x \to \frac{\pi}{4} - x = k\pi + 3x \to \frac{\pi}{4} + k\pi = 4x$

$\to \tan x \neq -1$

$\to \boxed{\frac{\pi}{16} + \frac{k\pi}{4} = x}$



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$\sqrt{\underbrace{1+\sin 2x}_{(\sin+\cos)^2}} = \sqrt{2}\cos 3x \to |\sin x + \cos x| = \sqrt{2}\cos 3x$

$\sin x + \cos x \geq 0 \to \cancel{\sqrt{2}}\sin\left(x+\frac{\pi}{4}\right) = \cancel{\sqrt{2}}\cos 3x \to \cos\left(\frac{\pi}{4}-x\right) = \cos 3x \to 3x = 2k\pi + \frac{\pi}{4} - x$

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

$\to 4x = 2k\pi + \frac{\pi}{4} \to x = \frac{2k\pi}{4} + \frac{\pi}{16} \longrightarrow \frac{\pi}{16}, \frac{\pi}{4}$

$x = 2k\pi - \frac{\pi}{4}$ $\quad$ بازه $[0, \pi]$ $\quad$ ۲ جواب

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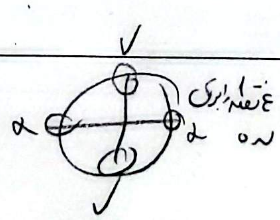
الف $\quad \sin^4 - \cos^4 = 1$



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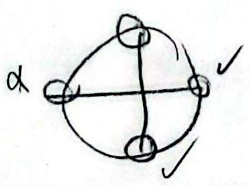
ب $\quad \sin^3 x - \cos^3 x = -1$



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