نام و نام خانوادگی ....آیسا برسین.......... پاسخنامه تشریحی تکلیف شماره ۱۶..... کلاس ..دوازدهم تجربی A.....

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

$\searrow \sin x = \frac{1}{2}$ ✓

$\boxed{x = 2k\pi + \frac{\pi}{6}}$ یا $\boxed{x = 2k\pi + \frac{5\pi}{6}}$

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

$\searrow \cos x = 1$ ✓

$\boxed{x = 2k\pi}$

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الف) $\sin^4 x - \cos^4 x = \sin 4x \longrightarrow \sin^2 x - \cos^2 x = \sin 4x \longrightarrow -\cos 2x = 2\sin 2x \cos 2x$

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

$\longrightarrow \sin 2x = -\frac{1}{2} \longrightarrow 2x = 2k\pi - \frac{\pi}{6} \longrightarrow x = k\pi - \frac{\pi}{12}$

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

ب) $2\cos^2 x + 2\sin x \cos x = 1 \longrightarrow \cancel{1} + \cos 2x + \sin 2x = \cancel{1} \longrightarrow \sin 2x + \cos 2x = 0 \longrightarrow 2x = k\pi + \frac{\pi}{4}$

$x = \frac{k\pi}{2} + \frac{\pi}{8}$

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الف) $\frac{\cos x}{\cancel{\sin x}}(2\cos x + 1) = \frac{1}{\cancel{\sin x}} \xrightarrow{\sin x \neq 0} 2\cos^2 x + \cos x - 1 = 0 \longrightarrow \cos x = -1$

$\searrow \cos x = \frac{1}{2}$ + $\sin x \neq 0 \Rightarrow$

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

ب) $\sin^2 x + \underbrace{\sin^2 x + \cos^2 x}_{1} - \sin x \cos x = 2 \longrightarrow \sin^2 x - \sin x \cos x = 1 \longrightarrow \cos x = 0 \longrightarrow x = k\pi + \frac{\pi}{2}$

$\downarrow \div \cos^2 x$

$\cancel{\tan^2 x} - \tan x = \cancel{\tan^2 x} + 1$

$\tan x = -1 \longrightarrow x = k\pi - \frac{\pi}{4}$

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

$\sin(\frac{\pi}{4} + x)$

$\cos 2x = \frac{1}{2}$

$\Rightarrow 2x = 2k\pi \pm \frac{\pi}{3} \rightsquigarrow x = k\pi \pm \frac{\pi}{6}$

ب) $\cos(2x - \frac{\pi}{9}) = \underbrace{-\sin 2x}_{\cos(\frac{\pi}{2} + 2x)} \longrightarrow \cancel{2x} - \frac{\pi}{9} = \cancel{2x} + \frac{\pi}{2} + 2k\pi$ ✗

$\searrow 2x - \frac{\pi}{9} = -2x - \frac{\pi}{2} + 2k\pi \longrightarrow x = \frac{k\pi}{2} - \frac{7\pi}{72}$

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

$\sin 2x \neq 0$

$2x \neq k\pi$

$\sin 4x + \cancel{\sin 2x} = \cancel{\sin 2x} \longrightarrow \sin 4x = 0 \longrightarrow 4x = k\pi \longrightarrow x = \frac{k\pi}{4}$ I

$x \neq \frac{k\pi}{2}$ II

$\mathrm{I}, \mathrm{II} \longrightarrow x = k\pi \pm \frac{\pi}{4}$

$\alpha=\frac{x}{2} \rightarrow \frac{\sin\alpha}{1+\cos\alpha}=\frac{1+\cos\alpha}{\sin\alpha}$ $\sin\alpha\neq 0$, $\cos\alpha\neq -1$ $\sin^2\alpha = 1+\cos^2\alpha+2\cos\alpha \rightarrow \cancel{\sin^2\alpha}=\cancel{\sin^2\alpha}+\cos^2\alpha+\cos^2\alpha+2\cos\alpha$ $2\cos^2\alpha+2\cos\alpha=0 \rightarrow 2\cos\alpha(\cos\alpha+1)=0 \rightarrow \cos\alpha=0 \rightarrow \frac{x}{2}=k\pi+\frac{\pi}{2}$ $\rightarrow \cos\alpha=-1$ ✗ $x=2k\pi+\pi$ در بازه $[-\pi,\frac{3\pi}{2}] \rightarrow -\pi, \pi$ جواب‌ها $\rightarrow \lvert-\pi-\pi\rvert=2\pi$	۶
$\cos^2x-\sin^2x\cos^2 3x=1 \rightarrow \underbrace{\cos^2x-1}_{-\sin^2x}=\sin^2x\cos^2 3x \rightarrow \sin x=0 \rightarrow x=k\pi$ $\rightarrow \cos 3x=-1 \rightarrow 3x=2k\pi+\pi \rightarrow x=\frac{2k\pi}{3}+\frac{\pi}{3}$ در بازه $[0,2\pi] \rightarrow$ ۵ جواب	۷
$\frac{1-\tan x}{1+\tan x}=\tan 3x \rightarrow \tan(\frac{\pi}{4}-x)=\tan 3x \rightarrow 3x=\frac{\pi}{4}-x+k\pi \rightarrow 4x=k\pi+\frac{\pi}{4}$ $x=\frac{k\pi}{4}+\frac{\pi}{16}$ $\tan x\neq -1 \rightarrow x\neq k\pi+\frac{\pi}{4}$	۸
$\sqrt{1+\sin 2x}=\sqrt{2}\cos 2x \rightarrow \sqrt{(\sin x+\cos x)^2}=\sqrt{2}(\cos^2x-\sin^2x)$ $\lvert\sin x+\cos x\rvert=\sqrt{2}(\sin x+\cos x)(\cos x-\sin x) \rightarrow \cos x-\sin x=\pm\frac{\sqrt{2}}{2} \rightarrow \sin(x-\frac{\pi}{4})=\pm\frac{\sqrt{2}}{2}$ $x-\frac{\pi}{4}=k\pi\pm\frac{\pi}{4} \rightarrow x=k\pi$, $x=k\pi+\frac{\pi}{2}$ $\Big\}$ $\xrightarrow{[0,\pi]}$ سه جواب	۹
الف) $\sin^4x-\cos^4x=1 \rightarrow (\cancel{\sin^2x+\cos^2x})(\sin^2x-\cos^2x)=1 \rightarrow \cos 2x=-1$ $2x=2k\pi+\pi$ در بازه $[0,2\pi] \rightarrow$ ۲ جواب $\rightarrow \frac{\pi}{2}, \frac{3\pi}{2}$ $x=k\pi+\frac{\pi}{2}$ ب) $\sin^3x-\cos^3x=-1 \rightarrow (\sin x-\cos x)(1+\sin x\cos x)=-1 \rightarrow \sin x\cos x=0$ در بازه $[0,2\pi] \rightarrow$ ۳ جواب $\rightarrow 0, \frac{3\pi}{2}, 2\pi$	۱۰