۴٫۲۵

نام و نام خانوادگی ......فریبا غازی...... پاسخنامه تشریحی تکلیف شماره ...... کلاس ......

۱	$\cos 2x + \cos x - 2 = 0$ $2\cos^2 x - 1 + \cos x - 2 = 2\cos^2 x + \cos x - 3$ $2\cos^2 x + \cos x - 3 = (\cos x + \frac{3}{2})(\cos x - 1)$ $\to x = 2k\pi$ $-\frac{3}{2}$ × $\cos x = \frac{1}{2} \Rightarrow 2k\pi \pm \frac{\pi}{3}$ ۰٫۷۵	$\cos 2x = 3\sin x - 1 \Rightarrow 1 - 2\sin^2 x = 3\sin x - 1$ $2\sin^2 x + 3\sin x - 2 \Rightarrow \sin^2 x + \frac{3}{2}\sin x - 4$ $(\sin x + 4)(\sin x - 1)$ $\sin x = \frac{1}{2}$ $\frac{-4}{2} = -2$ × $\frac{1}{2}$ ✓ $x = 2k\pi \pm \frac{\pi}{6}$ $x = 2k\pi + \frac{\pi}{6}$ $x = 2k\pi + \frac{5\pi}{6}$
۲	$2\cos^2 x + 2\sin x \cos x = 1$ $2\cos^2 x = 1 + \cos 2x$ $1 + \cos 2x + \sin 2x = 1$ $\cos 2x + \sin 2x = 0$ $\cos 2x = -\sin 2x$ $1 + \tan 2x = 0 \to x = \frac{k\pi}{2} - \frac{\pi}{8}$ ۰٫۲۵	$\sin^4 x - \cos^4 x = -\cos 2x$ $-\cos 2x = \sin 4x$ الف) $\cos 2x(2\sin 2x + 1) = 0$ $\cos 2x = 0 \to x = \frac{k\pi}{2} + \frac{\pi}{4}$ $\sin 2x = -\frac{1}{2} \to 2k\pi + \frac{7\pi}{6},\ 2k\pi - \frac{\pi}{6}$
۳	$2\sin^2 x - \cancel{\sin x \cos x} + \cos^2 x = 2$ $-\frac{1}{2}\sin 2x$ $\sin^2 x - \frac{1}{2}\sin 2x + 1 = 2 \Rightarrow \sin^2 x - \frac{1}{2}\sin 2x - 1 = 0$ $\Delta = (-\frac{1}{2})^2 - 4(-\frac{1}{2})(-1) = \frac{1}{4} - 2 = -\frac{7}{4}$ تعریف نشده جواب ندارد $1 + \tan x = 0 \to x = k\pi - \frac{\pi}{4}$ ۱٫۲۵	$\frac{\cos x}{\sin x} \times (2\cos x + 1) = \frac{1}{\sin x}$ $\frac{2\cos^2 x + \cos x}{\sin x} = \frac{1}{\sin x} \Rightarrow 2\cos^2 x + \cos x = 1$ $2\cos^2 x + \cos x - 1 = 0 \Rightarrow \cos^2 x + \cos x - 2 = 0$ $(\cos x + 2)(\cos x - 1)$ $\boxed{2k\pi \pm \frac{\pi}{3}}$ ✓ $-\frac{2}{2} = -1$ $\frac{1}{2}$ ~~$2k\pi \pm \pi$~~
۴	الف) $\sin(\frac{\pi}{2} + 2x) = \frac{1}{2} \to \cos 2x = \frac{1}{2} \to x = k\pi \pm \frac{\pi}{6}$ ب) $\cos(2x - \frac{\pi}{6}) = \cos(\frac{\pi}{2} + 2x) \to x = \frac{k\pi}{2} - \frac{7\pi}{12}$ ۰	
۵	$\frac{\sin 4x + \sin 2x}{\sin 2x} - \sin^2 x = \cos^2 x \Rightarrow \frac{\sin 4x}{\sin 2x} + 1 - \sin^2 x = \cos^2 x$ $\frac{\sin 4x}{\sin 2x} + \cancel{\cos^2 x} = \cancel{\cos^2 x} \Rightarrow \frac{\sin 4x}{\sin 2x} = 0$ $\sin 4x = 0$ $2\cos 2x + 1 = \ \to x = \frac{k\pi}{2} + \frac{\pi}{4}$ ۰٫۵	

فربد غازی

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

$1+\cos^2\frac{x}{2} + 2\cos\frac{x}{2} = \sin^2\frac{x}{2} \Rightarrow \cos^2\frac{x}{2} - \sin^2\frac{x}{2} + 1 + 2\cos\frac{x}{2} = 0$ ۰٫۵

$\cos x + 2\cos\frac{x}{2} + 1 = 0$

$k=0 \to x=\pi$ $\quad k=-1 \to x=-\pi$ $\quad |-\pi-\pi| = 2\pi$

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$\sin x = 0 \to x = 0, \pi, 2\pi$

$\cos 3x = -1 \to x = \frac{\pi}{3}, \pi, \frac{5\pi}{3}$ ۰

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$\frac{1+\tan x}{1-\tan x}\frac{(1+\tan x)}{(1+\tan x)} = \tan 2x \Rightarrow \frac{(1+\tan^2 x)}{(1-\tan^2 x)} = \tan 2x$ ۰

$\tan(\frac{\pi}{4}-x) = \tan 2x \to \frac{\pi}{4} - x = k\pi + 2x \to x = \frac{k\pi}{4} + \frac{\pi}{14}$

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$\sqrt{1+\sin 2x} = \sqrt{2}\cos 2x \Rightarrow 1+\sin 2x = 2\cos^2 2x$

$\sin^2 2x + \cos^2 2x + \sin 2x = 2\cos^2 2x \Rightarrow \sin 2x = 2\cos^2 2x - \cos^2 2x - \sin^2 2x$ ۰٫۵

$\sin 2x = -1 \to x = k\pi - \frac{\pi}{4} \to \frac{3\pi}{4}$

$\sin 2x = \cos^2 2x - \sin^2 2x \Rightarrow \sin 2x = \cos 4x$

$x = k\pi + \frac{\pi}{12} \to \frac{\pi}{12}$

۱۰

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

$-\cos 2x = 1 \Rightarrow \cos 2x = -1$

ب) $0, 2\pi, \frac{3\pi}{2}$

$\sin^3 x - \cos^3 x = -1$ ۰٫۵

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

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

الف) $x = \frac{\pi}{2}, \frac{3\pi}{2}$