نام و نام خانوادگی: دلارام میرزاباصریان — پاسخنامه تشریحی تکلیف شماره ۱۶ — کلاس دوازدهم دختر B

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الف) $1-2\sin^2 x = 3\sin x - 1$

$2\sin^2 x + 3\sin x - 2 = 0$

$\frac{-3\pm5}{4}$: -2 غ ق ق ؛ $\frac{1}{2}$ ✓ $\to \sin x = \sin\frac{\pi}{6}$

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

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

ب) $\cos 2x + \cos x - 2 = 0 \to 2\cos^2 x + \cos x - 3 = 0$

$\cos x = 1$ ✓ یا $-\frac{3}{2}$ غ ق ق

$\cos x = 1$

$x = 2k\pi$

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الف) $\sin^4 x - \cos^4 x = \sin 4x$

$-\cancel{\cos 2x} = 2\sin 2x\cancel{\cos 2x} \to \cos 2x = 0$

$\sin 2x = -\frac{1}{2} \to \sin(-\frac{\pi}{6})$ ؛ $2x = k\pi + \frac{\pi}{2}$ ؛ $x = \frac{k\pi}{2} + \frac{\pi}{4}$

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

$2x = 2k\pi + \pi + \frac{\pi}{6} = \frac{7\pi}{6}$ ؛ $x = k\pi + \frac{7\pi}{12}$

ب) $\cancel{2\cos^2 x} + 2\sin x\cos x = 1 - 2\cos^2 x$

$\sin 2x = -\cos 2x$

$\tan 2x = -1 \to \tan(\frac{3\pi}{4})$

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

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الف) $\underbrace{\cot x}_{\frac{\cos x}{\sin x}}(2\cos x + 1) = \frac{1}{\sin x}$

$\to 2\cos^2 x + \cos x - 1 = 0$: -1 ، $\frac{1}{2}$

$x = 2k\pi + \pi$

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

ب) $2\sin^2 x - \sin x\cos x + \cos^2 x = 2$

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

$\xrightarrow[\div\cos^2 x]{\cos x \neq 0} \tan^2 x - \tan x - (1+\tan^2 x) = 0 \to \tan x = -1$

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

$\xrightarrow{\cos x = 0} 2\sin^2 x = 2 \to \sin^2 x = 1 \to \sin x = \pm 1$

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

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الف) $\cos(\frac{\pi}{4}+x)\cos(x-\frac{\pi}{4}) = \frac{1}{4}$

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

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

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

$\frac{1}{2}\cos 2x = \frac{1}{4} \to \cos 2x = \frac{1}{2}$

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

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

$\cancel{2x} - \frac{\pi}{9} = 2k\pi + \cancel{2x} + \frac{\pi}{2} \to$ جواب ✗

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

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

$\boxed{x = \frac{k\pi}{2} - \frac{7\pi}{72}}$

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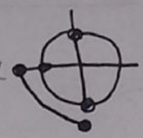
$\frac{\sin 4x + \sin 2x}{\sin 2x} - \cancel{\sin^2 x} = \underbrace{\cos^2 x + \sin^2 x}_{1}$

$\frac{\sin 4x + \sin 2x}{\sin 2x} = 1 \to \sin 4x + \cancel{\sin 2x} = \cancel{\sin 2x}$

$\sin 4x = 0$

$4x = k\pi \to x = \frac{k\pi}{4}$

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

$-\pi$  $\left|\frac{3\pi}{2}-(-\pi)\right| = \frac{5\pi}{2}$

$$\overset{\cancel{1}-\cos^2\frac{x}{2}}{\sin^2\frac{x}{2}} = \cancel{1}+\cos^2\frac{x}{2}+2\cos\frac{x}{2}$$

$\cos\frac{x}{2}=0 \to \frac{x}{2}=k\pi+\frac{\pi}{2} \to \underline{x=2k\pi+\pi}$ ۶

$2\cos^2\frac{x}{2}+2\cos\frac{x}{2}=0 \to 2\cos\frac{x}{2}\left(\cos\frac{x}{2}+1\right)=0 \to \cos\frac{x}{2}=-1 \to \frac{x}{2}=2k\pi+\pi$

$\to \underline{x=4k\pi+2\pi}$

$\underbrace{\cos^2x}_{1-\sin^2x} - \sin^2x\cos 3x = 1$ $\underbrace{0, \pi, 2\pi, \frac{\pi}{3}}_{\text{مشترک}}, \pi, \frac{5\pi}{3} \longrightarrow$ ۵ جواب

$\cancel{1}-\sin^2x-\sin^2x\cos 3x=\cancel{1}$

$\sin^2x(1+\cos 3x)=0$  ۷

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

$1+\cos 3x=0 \to 3x=2k\pi+\pi$ $2\pi, \pi, 0$

$\cos 3x=-1$ $\boxed{x=\frac{2k\pi}{3}+\frac{\pi}{3}}$

K	0	1	2	~~3~~
	$\frac{\pi}{3}$	$\frac{3\pi}{3}$	$\frac{5\pi}{3}$	$\frac{7\pi}{3}$

$\frac{1-\tan x}{1+\tan x} = \tan 3x$

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

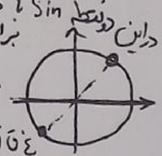
$4x = k\pi+\frac{\pi}{4}$

$\tan\left(\frac{\pi}{4}-x\right) = \tan 3x$ ۸

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

$\underbrace{\sqrt{1+\sin 2x}}_{\text{همراه } 0 \oplus} = \sqrt{2}\,\underline{\cos 2x}$ * باید مثبت باشد $\xrightarrow{\text{توان ۲}} 1+\sin 2x = 2\cos^2 2x$

$\sin 2x = 2\cos^2 2x - 1$ در این دو نقطه Sin و Cos برابر

$\sin 2x = \cos 2x \longrightarrow$ 

$2x = 2k\pi+\frac{\pi}{4} \to x = k\pi+\frac{\pi}{8}$ ۹

K	0 ✓	1 ✗
	$\frac{\pi}{8}$	$\frac{9\pi}{8}$

یک جواب

الف) $-(\cos^4x-\sin^4x)=1$

$-\cos 2x=1 \to \cos 2x=-\cancel{1}$

$2x=2k\pi+\pi \to x=k\pi+\frac{\pi}{2}$ ۱۰

K	0	1	~~2~~
	$\frac{\pi}{2}$	$\frac{3\pi}{2}$	$\frac{5\pi}{2}$

ب) $\sin^3x-\cos^3x=-1$

① $\sin x=0$, $\cos x=1 \longrightarrow 0, 2\pi$

② $\sin x=-1$, $\cos x=0 \longrightarrow \frac{3\pi}{2}$