نام و نام خانوادگی ...نگاره ایرانی... پاسخنامه تشریحی تکلیف شماره ...۱۶... کلاس ...تجربی دوازدهم A...

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الف) $\cos 2x = 3\sin x - 1 \to \cos^2 x - \sin^2 x = 3\sin x - 1$

$1 - 2\sin^2 x = 3\sin x - 1 \to 2\sin^2 x + 3\sin x - 2 = 0$

$\sin x_1 , \sin x_2 = \dfrac{-3 \pm \sqrt{9+16}}{4} \to \sin x_1 = \frac{1}{2}$ ✓ ، $\sin x_2 = -2$ غ ق ق

$\to \sin x = \frac{1}{2} \to x = 2k\pi + \frac{\pi}{6}$ ، $x = 2k\pi + \frac{5\pi}{6}$

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

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

$\to 2\cos^2 x + \cos x - 3 = 0$ مجموع ضرایب صفر

$\to \cos x_1 = 1$ ✓ $\to \boxed{x = 2k\pi}$

$\to \cos x_2 = -\frac{3}{2}$ غ ق ق

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الف) $(\sin^2 x - \cos^2 x)(\cancel{\sin^2 x + \cos^2 x}) = 2\sin 2x \cos 2x \to$

$-\cos 2x = 2\sin 2x \cos 2x \xrightarrow{\cos 2x \neq 0} \sin 2x = -\frac{1}{2}$

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

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

$\cos 2x = 0 \to x = k\pi \pm \pi/4$

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

$\cos^2 x - \sin^2 x + 2\sin x \cos x = 0 \to$

$\cos 2x + \sin 2x = 0 \to \sqrt{2}\sin(2x + \pi/4) = 0 \to$

$\sin(2x + \pi/4) = 0$

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

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

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ب) $\sin^2 x - \frac{1}{2}\sin 2x + 1 = 2 \to \sin^2 x - \frac{1}{2}\sin 2x = \sin^2 x + \cos^2 x \to -\sin x \cos x = \cos^2 x \xrightarrow{\cos x \neq 0}$

$-\sin x = \cos x \to \sin x + \cos x = 0 \to \sqrt{2}\sin(x + \pi/4) = 0 \to \sin(x + \pi/4) = 0$

$\to x + \frac{\pi}{4} = k\pi \to x = k\pi - \pi/4$ ، $\cos x = 0 \to x = k\pi + \pi/2$

الف) $\cot x(2\cos x + 1) = \dfrac{1}{\sin x} \to \dfrac{\cos x}{\sin x}(2\cos x + 1) = \dfrac{1}{\sin x} \xrightarrow{\sin x \neq 0}$

$2\cos^2 x + \cos x - 1 = 0 \to \cos x_1 = -1$ ✓ $\to x = 2k\pi + \pi$

$\cos x_2 = 1/2$ ✓ $\to x = 2k\pi \pm \pi/3$

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ب) $\cos(2x - \pi/9) = \sin(\frac{\pi}{2} - 2x + \frac{\pi}{9}) = -\sin 2x \to \sin(\frac{19\pi}{18} - 2x) = \sin(-2x)$

$\to \frac{19\pi}{18} - 2x = 2k\pi - 2x$ غ ق ق

$19\pi/18 - 2x = 2k\pi + \pi + 2x \to 4x = 2k\pi + \frac{\pi}{18} \to x = \frac{k\pi}{2} + \frac{\pi}{72}$

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

$\frac{1}{2}\sin(2x + \frac{\pi}{2}) = 1/4 \to \cos 2x = 1/2 \to 2x = 2k\pi \pm \pi/3 \to x = k\pi \pm \pi/6$

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$\dfrac{\sin 4x + \sin 2x}{\sin 2x} = \sin^2 x + \cos^2 x \to \dfrac{\sin 4x}{\sin 2x} + \dfrac{\sin 2x}{\sin 2x} = 1 \to \dfrac{2\sin 2x \cos 2x}{\sin 2x} = 0$

$\to \cos 2x = 0 \to 2x = 2k\pi \pm \dfrac{\pi}{2} \to x = k\pi \pm \dfrac{\pi}{4}$

$\tan\frac{x}{4} = \frac{1+\cos\frac{x}{2}}{\sin\frac{x}{2}} = \frac{1}{\tan\frac{x}{4}} \to \tan^2\frac{x}{4} = 1 \to \tan\frac{x}{4} = \pm 1 \to$ ۶

$\frac{x}{4} = k\pi \pm \frac{\pi}{4} \to x = 4k\pi \pm \pi \xrightarrow{\text{در بازه } [-\pi, \frac{5\pi}{2}]} -\pi \text{ و } \pi$

$|\pi - (-\pi)| = \underline{2\pi}$

$\cos^2 x - \sin^2 x \cos 3x = \sin^2 x + \cos^2 x \to \sin^2 x = -\sin^2 x \cos 3x$

$\underline{\sin^2 x = 0}, \ \cos 3x = -1 \to 3x = 2k\pi + \pi \to \boxed{x = \frac{2k\pi}{3} + \frac{\pi}{3}} \to \frac{\pi}{3} \text{ و } \pi \text{ و } \frac{5\pi}{3}$ ۷

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

جواب های معادله: 2π و $\frac{5\pi}{3}$ و π و $\frac{\pi}{3}$ و 0

$\dfrac{\frac{\cos x - \sin x}{\cos x}}{\frac{\cos x + \sin x}{\cos x}} = \frac{\cos x - \sin x}{\cos x + \sin x} = \frac{\sin 3x}{\cos 3x} \to \cos 3x \cos x - \sin x \cos 3x = \sin 3x \cos x + \sin 3x \sin x$

$\cos x \sin 3x + \sin x \cos 3x \to$ ۸

$\to \cos x \cos 3x - \sin x \sin 3x = \ldots \ \sin 4x - \cos 4x = 0 \to \sqrt{2}\sin(4x - \frac{\pi}{4}) = 0$

$\cos 4x = \sin 4x$

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

$\to \sin(4x - \frac{\pi}{4}) = 0$

توان ۲: $1 + \sin 2x = 2\cos^2 2x \to \sin 2x = \cos 4x \to \sin 2x = \sin(\frac{\pi}{2} - 4x)$

$2x = 2k\pi + \frac{\pi}{2} - 4x \to x = \frac{k\pi}{3} + \frac{\pi}{12} \xrightarrow{\text{در بازه } [0, \pi]} \frac{\pi}{12}, \frac{5\pi}{12}$ ۹

$2x = 2k\pi + \pi - \frac{\pi}{2} + 4x \to x = k\pi + \frac{\pi}{4} \qquad \frac{9\pi}{12}, \frac{\pi}{4}$

$\boxed{\text{مجموعه جواب}}$ جواب های ۱۰ در بازه $[0, 2\pi]$:

$\frac{\pi}{2}$ و 0 و $\frac{3\pi}{2}$ و π و 2π

ب)

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

$1 + \frac{1}{2}\sin 2x = \frac{1}{\sin x - \cos x} \xrightarrow{\text{توان ۲}} \frac{1}{4}\sin^2 2x + \sin 2x + 1 = \frac{1}{1 - \sin 2x} \to \frac{1}{4}\sin^2 2x + \sin 2x = \frac{\sin 2x}{1 - \sin 2x} \xrightarrow{\sin 2x = 0}$ ۱۰

$\frac{1}{4}\sin 2x = \frac{\sin 2x}{1 - \sin 2x} \to \frac{1}{4} = \frac{1}{1 - \sin 2x} \to \sin 2x = -3$ غ ق ق

$\sin 2x = 0 \to 2x = k\pi \to x = \frac{k\pi}{2} \to$ ادامه مثل الف

الف)

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

$\to -\cos^2 x = 1 - \sin^2 x \to$

$-\cos^2 x = \cos^2 x \to$

$\cos x = 0 \to$

$x = k\pi + \frac{\pi}{2} \xrightarrow{\text{در بازه } [0, 2\pi]} \frac{\pi}{2}, \frac{3\pi}{2}$