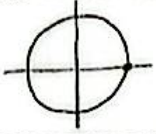
نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره ...۱۶... کلاس ....A

۱

الف) $1-2\sin^2x=3\sin x-1 \longrightarrow 2\sin^2x+3\sin x-2=0 \longrightarrow \begin{cases}\sin x=-\frac{1}{2} \longrightarrow \boxed{x=2k\pi+\frac{7\pi}{6},\ x=2k\pi+\frac{11\pi}{6}}\\ \sin x=-2 \text{ غ ق ق}\end{cases}$

ب) $2\cos^2x-1+\cos x-2=0 \longrightarrow 2\cos^2x+\cos x-3=0 \longrightarrow \begin{cases}\cos x=1 \longrightarrow \boxed{x=2k\pi}\\ \cos x=-\frac{3}{2} \text{ غ ق ق}\end{cases}$



۲

الف) $-\cos 2x=\sin 4x \longrightarrow \cos(\pi-2x)=\cos(\frac{\pi}{2}-4x)$

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

$\pi-2x=2k\pi-\frac{\pi}{2}+4x \longrightarrow 6x=-2k\pi+\frac{3\pi}{2} \longrightarrow \boxed{x=-\frac{k\pi}{3}+\frac{\pi}{4}}$

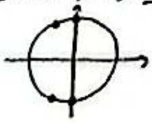
ب) $2\sin x\cos x=1-2\cos^2x \longrightarrow \sin 2x=-\cos 2x \longrightarrow \cos(\frac{\pi}{2}-2x)=\cos(\pi-2x)$

$\frac{\pi}{2}-2x=2k\pi+\pi-2x \longrightarrow -\frac{\pi}{2}=2k\pi$ غ ق ق

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

۳

الف) $\frac{\cos x}{\sin x}(2\cos x+1)=\frac{1}{\sin x} \longrightarrow 2\cos^2x+\cos x=0 \quad (\sin x\neq 0) \longrightarrow \begin{cases}\cos x=0 \longrightarrow x=2k\pi\pm\frac{\pi}{2}\\ \cos x=-\frac{1}{2} \longrightarrow x=2k\pi\pm\frac{2\pi}{3}\end{cases}$



ب) $\sin^2x-\sin x\cos x=1 \longrightarrow -\cos^2x=\sin x\cos x \longrightarrow -\cos x=\sin x \longrightarrow \cos(\pi-x)=\cos(\frac{\pi}{2}-x)$

$\pi-x=2k\pi+\frac{\pi}{2}-x \longrightarrow -\frac{\pi}{2}=2k\pi$ غ ق ق

$\pi-x=2k\pi-\frac{\pi}{2}+x \longrightarrow 2x=-2k\pi+\frac{3\pi}{2} \longrightarrow \boxed{x=-k\pi+\frac{3\pi}{4}}$

۴

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

$=-\frac{1}{2}\sin(\frac{\pi}{2}+2x)=-\frac{1}{2}\sin 2x=\frac{1}{4} \longrightarrow \sin 2x=-\frac{1}{2} \longrightarrow \begin{cases}2x=2k\pi+\frac{7\pi}{6} \longrightarrow x=k\pi+\frac{7\pi}{12}\\ 2x=2k\pi+\frac{11\pi}{6} \longrightarrow x=k\pi+\frac{11\pi}{12}\end{cases}$

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

$2x-\frac{\pi}{9}=2k\pi+\frac{\pi}{2}+2x \longrightarrow -\frac{11\pi}{18}=2k\pi$ غ ق ق

$2x-\frac{\pi}{9}=2k\pi-\frac{\pi}{2}-2x \longrightarrow 4x=2k\pi-\frac{7\pi}{18} \longrightarrow \boxed{x=\frac{k\pi}{2}-\frac{7\pi}{72}}$

۵

$1+\frac{2\sin 2x\cos 2x}{\sin 2x}=\cos^2x+\sin^2x=1 \longrightarrow \cos 2x=0 \quad (\sin 2x\neq 0)$

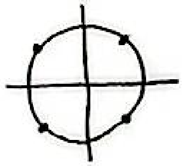
$2x=2k\pi+\frac{\pi}{2} \longrightarrow x=k\pi+\frac{\pi}{4}$

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

۶

$\frac{\sin\frac{x}{2}}{1+\cos\frac{x}{2}} = \frac{1+\cos\frac{x}{2}}{\sin\frac{x}{2}} \to \tan x = \frac{1}{\tan x} \to \tan^2 x = 1 \quad (\tan x \neq 0)$

$\tan x = 1 \to x = k\pi + \frac{\pi}{4}$



$\boxed{\left|k\pi + \frac{3\pi}{4} - k\pi - \frac{\pi}{4}\right| = \frac{\pi}{2}}$

$\tan x = -1 \to x = k\pi + \frac{3\pi}{4}$

$x \in [-\pi, \frac{3\pi}{2}] \to x = \{-\frac{3\pi}{4}, -\frac{\pi}{4}, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}\}$

۷

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

$\sin^2 x = 0 \to \sin x = 0 \to x = k\pi$

$1 + \cos 3x = 0 \to \cos 3x = -1 \to 3x = 2k\pi + \pi \to x = \frac{2k\pi}{3} + \frac{\pi}{3}$

$x \in [0, 2\pi] \to x = \{0, \frac{\pi}{3}, \pi, \frac{5\pi}{3}, 2\pi\}$ $\boxed{\text{۵ جواب}}$

۸

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

۹

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

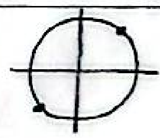
$4x = 2k\pi + \frac{\pi}{2} - 2x \to 6x = 2k\pi + \frac{\pi}{2} \to \boxed{x = \frac{k\pi}{3} + \frac{\pi}{12}}$

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

$x \in [0, 2\pi] \to x = \{\frac{\pi}{12}, \frac{\pi}{4}, \frac{5\pi}{12}, \frac{3\pi}{4}\}$ $\boxed{\text{۴ جواب}}$

۱۰

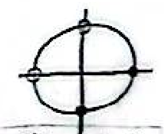
الف) $-\cos 2x = 1 \to \cos 2x = -1 \to 2x = 2k\pi + \frac{\pi}{2} \to \boxed{x = k\pi + \frac{\pi}{4}}$



$x \in [0, 2\pi] \to x = \boxed{\{\frac{\pi}{4}, \frac{5\pi}{4}\}}$

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

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



$\to \sin^2 2x + 8\sin 2x = 0 \to \begin{cases} \sin 2x = 0 \to 2x = k\pi \to \boxed{x = \frac{k\pi}{2}} \\ \sin 2x = -8 \quad \text{غ ق ق} \end{cases}$

$x \in [0, 2\pi] \to x = \boxed{\{0, \frac{3\pi}{2}, 2\pi\}}$