نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس ..... سری .....

الف) $\to 1-2\sin^2 x = 3\sin x - 1$

$\to 2\sin^2 x + 3\sin x - 2 = 0 \to \sin x = \begin{cases} -2 \text{ (غ ق ق)} \\ \frac{1}{2} \end{cases}$

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

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

$\to 2\cos^2 x + \cos x - 3 = 0$ $\quad a+b+c=0$

$\to \cos x = 1, \left(-\frac{3}{2}\right)$ (غ ق ق)

$\hookrightarrow x = 2k\pi$

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

$\to \cos 2x (2\sin 2x + 1) = 0 \to \cos 2x = 0 \to x = \frac{k\pi}{2} + \frac{\pi}{4}$

$\hookrightarrow \sin 2x = -\frac{1}{2} \to 2x = 2k\pi - \frac{\pi}{6}, 2k\pi - \frac{5\pi}{6}$

$x = k\pi - \frac{\pi}{12} \quad x = k\pi - \frac{5\pi}{12}$

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

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

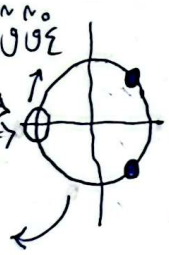
$\to 2x = k\pi - \frac{\pi}{4} \to x = \frac{k\pi}{2} - \frac{\pi}{8}$

الف) $\to 2\cos^2 x + \cos x - 1 = 0$

$\sin x \to \sin x \neq 0$ (غ ق ق)

$\to \cos x = -1, \cos x = \frac{1}{2} \Rightarrow$

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



ب) $\div \sin^2 x \to 2 - \cot x + \cot^2 x = 2(1 + \cot^2 x)$

$\to \cot x (\cot x + 1) = 0 \to \cot x = 0 \to x = k\pi + \frac{\pi}{2}$

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

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

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

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

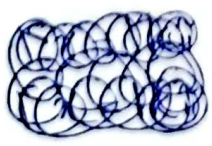
ب) $\cos\left(2x - \frac{\pi}{9}\right) = -\cos\left(\frac{\pi}{2} - 2x\right)$

$= \cos\left(\pi - \left(\frac{\pi}{2} - 2x\right)\right) \to \cos\left(2x - \frac{\pi}{9}\right)$

$2x - \frac{\pi}{9} = 2x + \frac{\pi}{2}$ (غ ق ق)

$2x - \frac{\pi}{9} = -2x - \frac{\pi}{2}$ ✓ $\leftarrow \cos\left(\frac{\pi}{2} + 2x\right)$

$\to \frac{\sin 4x + \sin 2x}{\sin 2x} = 1 \to 2\sin 2x (\cos 2x + \sin 2x = \sin 2x) \quad (\sin 2x \neq 0)$

$\sin 4x = 0 \to$ 

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

$$\rightarrow \frac{\sin\frac{x}{2}}{1+\cos\frac{x}{2}} = \frac{1+\cos\frac{x}{2}}{\sin\frac{x}{2}} \rightarrow \tan\frac{x}{4} = \frac{1}{\tan\frac{x}{4}} = \cot\frac{x}{4}$$

$$\rightarrow \quad \frac{\pi}{4} = \frac{x}{2} \rightarrow x = \frac{\pi}{2}$$
$$\frac{3\pi}{4} = \frac{3x}{4} \rightarrow x = \pi$$
$$\rightarrow |\pi - \frac{\pi}{2}| = \{\frac{\pi}{2}$$

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

$$\sin x = 0 \quad k\pi$$
$$\cos^2 x = -1 = \cos\pi \quad 2k\pi + \pi$$

$$[0, 2\pi] \Leftarrow \{0, \pi, 2\pi\}$$

$$\frac{1-\tan x}{1+\tan x} = \frac{\cos x - \sin x}{\cos x + \sin x} = \frac{\sin^2 x}{\cos^2 x}$$
$$\rightarrow \cos^2 x \cos x - \cos^2 x \sin x = \sin^2 x \cos x + \sin^2 x \sin x$$
$$= \sin^2 x(\cos x + \sin^2 x \sin x$$
$$\cos 2x = \sin 2x$$
$$2x = k\pi + \frac{\pi}{4} \quad x = \frac{k\pi}{2} + \frac{\pi}{8}$$

$$1 + \sin 2x = 2\cos^2 2x = 2(1 - \sin^2 2x) = 2 - 2\sin^2 2x$$
$$\rightarrow 2\sin^2 2x + \sin 2x - 1 = 0$$
$$\sin x = -1 \times$$
$$\sin x = \frac{1}{2}$$
$$\frac{\pi}{6}, \frac{5\pi}{6}$$

الف) $\sin^2 x - \cos^2 x = 1$

$$x = \frac{\pi}{2} \rightarrow 2k\pi + \frac{\pi}{2}$$
$$x = \frac{3\pi}{2} \rightarrow 2k\pi + \frac{3\pi}{2}$$
$$k\pi + \frac{\pi}{2}$$

ب) $\sin^2 x - \cos^2 x = -1$

$$0, \frac{\pi}{2}, \pi$$