تکالیف ۶/۱ مراد ساعی

۱)

الف) $\cos^2 x-\sin^2 x=3\sin x-1 \Rightarrow \cos^2-\sin^2-3\sin=1-2=2 \Rightarrow -2\sin^2-3\sin+2=0$

$\Rightarrow \sin=\frac{3\pm5}{-4}=-2,\frac{1}{2} \Rightarrow \sin x=\frac{1}{2} \Rightarrow x=\left\{2k\pi+\frac{\pi}{6},\ 2k\pi+\frac{5\pi}{6}\right\}$

ب) $\cos^2-\sin^2+\cos-2=0 \Rightarrow \cos^2-\sin^2+\cos-2+3-3 \Rightarrow 2\cos^2+\cos-3=0$

$\Rightarrow \cos=\frac{-1\pm5}{4}=-\frac{3}{2},1 \Rightarrow x=2k\pi$

---

۲)

الف) $\sin^2\alpha-\cos^2\alpha=2\sin2\alpha\cos2\alpha \Rightarrow -\cos2\alpha=2\sin2\alpha\cancel{\cos2\alpha}$

$\Rightarrow \sin2\alpha=-\frac{1}{2} \Rightarrow \alpha=\left\{2k\pi+\frac{7\pi}{12},\ 2k\pi+\frac{11\pi}{12}\right\}$

ب) $2\cos^2\alpha+2\sin\alpha\cos\alpha=1 \xrightarrow{2\cos^2\alpha=1+\cos2\alpha} 1+\cos2\alpha+\sin2\alpha=1 \Rightarrow \sin2\alpha=-\cos2\alpha$

$\Rightarrow \alpha=\left\{k\pi+\frac{3\pi}{8},\ k\pi+\frac{7\pi}{8}\right\}$

---

۳)

الف) $\frac{\cos(2(\cos+1))}{\cancel{\sin}}=\frac{1}{\cancel{\sin}} \Rightarrow 2\cos^2+\cos-1=0 \Rightarrow \cos=-1,\frac{1}{2}$

غ ق ق

$\Rightarrow x=\left\{2k\pi+\frac{\pi}{3},\ 2k\pi+\frac{5\pi}{3}\right\}$

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

$\Rightarrow x=\left\{k\pi+\frac{\pi}{2},\ k\pi+\frac{3\pi}{4}\right\}$

---

۴)

الف) $\left(\frac{\sqrt{2}}{2}\cos x-\frac{\sqrt{2}}{2}\sin x\right)\left(\frac{\sqrt{2}}{2}\cos x+\frac{\sqrt{2}}{2}\sin x\right)=\frac{1}{4} \Rightarrow \frac{1}{2}\cos^2-\frac{1}{2}\sin^2=\frac{1}{4}$

$\Rightarrow \cos2\alpha=\frac{1}{2} \Rightarrow x=\left\{2k\pi+\frac{\pi}{6},\ 2k\pi+\frac{5\pi}{6}\right\}$

ب) [illegible]

[illegible] $\sin\left(\frac{\pi}{2}-\left(2x-\frac{\pi}{9}\right)\right)=-\sin2x$

$\Rightarrow \sin2\alpha \rightarrow 2x=-\frac{7\pi}{18}\ \alpha$

$\Rightarrow x=\frac{k\pi}{2}+\frac{25\pi}{72}$

$$\frac{\sin 4x + \sin 2x}{\sin 2x} - \sin^2 x = \cos^2 x \Rightarrow \frac{2\sin 2x\cos 2x + \sin 2x}{\sin 2x} = \cancel{\frac{\sin 2x(2\cos 2x+1)}{\sin 2x}}$$ (۵

$$\Rightarrow 2\cos^2 - \sin^2 + 1 - \sin^2 = \cos^2 \Rightarrow 2\cos^2 = 2\sin^2 \Rightarrow \sin = \pm\cos \Rightarrow x = \left\{k\pi \pm \frac{\pi}{4}\right\}$$

$$\tan\frac{\alpha}{2} = \frac{\sin}{\cos + 1} \Rightarrow \frac{\sin\frac{\alpha}{2}}{\cos\frac{\alpha}{2} + 1} = \frac{\tan\alpha}{4} \Rightarrow \tan\frac{\alpha}{2} = \cot\frac{\alpha}{4}$$ (۶

$$\Rightarrow \alpha = \{\pi\} \Rightarrow \pi$$

$$-\sin 2x(2 + \cos 3x) = 0 \begin{cases} \sin 2x = 0 \Rightarrow \sin = 0 \Rightarrow x = k\pi \\ \cos 3x = -1 \Rightarrow 3x = -1 \Rightarrow 3x = 2k\pi + \pi \end{cases}$$ سه جواب (۷

(۸

$$\sin 2x + 1 = 2\cos^2 2x = 1 + \cos 4x \Rightarrow \sin 2x = \cos 4x \Rightarrow \sin 2x = 1 - 2\sin^2 2x$$ (۹

$$\Rightarrow 2\sin^2 2x + \sin 2x - 1 = 0 \Rightarrow \sin 2x = -1, \frac{1}{2} \Rightarrow x = \frac{\pi}{12}, \frac{3\pi}{4}$$

الف) $\sin^2 - \cos^2 = 1 \Rightarrow -\cos 2\alpha = 1 \Rightarrow \cos 2\alpha = -1 \Rightarrow x = \left\{k\pi + \frac{\pi}{2}\right\}$ (۱۰

ب) $\begin{cases} \sin = 0 & \cos = 1 \\ \sin = -1 & \cos = 0 \end{cases} \Rightarrow x = \left\{0, \frac{3\pi}{2}, 2\pi\right\}$