ملینا کیانی — آفرین خیلی خوب نوشتی !! ۲۰

(۲)

الف $\rightarrow 1-2\sin^2 = 3\sin - 1 \Rightarrow 2\sin^2 + 3\sin - 2 = 0$ $\quad \sin = -2$ ✗ $\quad \sin = \frac{1}{2}$ ✓

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

$\cos^2 x = \frac{1+\cos 2x}{2}$

ب $\rightarrow 2\cos^2 x + \cos x - 3 = 0 \rightarrow \cos = 1 \rightarrow x = 2k\pi$ ✓ ; $\cos = -\frac{3}{2}$ ✗

۲) الف $(\sin^2+\cos^2)(\sin^2-\cos^2) = \sin 4x \rightarrow -\cos 2x = \sin 4x$

(۲) $\sin(\frac{3\pi}{2} + 2x) = \sin 4x \rightarrow$ ① $4x = 2k\pi + \frac{3\pi}{2} + 2x \rightarrow k\pi + \frac{3\pi}{4}$ ✓

② $4x = 2k\pi + \pi - \frac{3\pi}{2} - 2x \rightarrow \frac{k\pi}{3} - \frac{\pi}{12}$ ✓

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

$\cos 2x = \cos(\frac{\pi}{2} + 2x) \rightarrow 2x = 2k\pi + \frac{\pi}{2} + 2x$ ✗ ; $2x = 2k\pi - \frac{\pi}{2} - 2x \rightarrow \frac{k\pi}{2} - \frac{\pi}{8}$ ✓

۳) الف $\frac{\cos}{\sin}(2\cos + 1) = \frac{1}{\sin} \;(\sin \neq 0) \rightarrow 2\cos^2 + \cos - 1 = 0 \rightarrow -1$ ✗ ; $\frac{1}{2} \rightarrow 2k\pi \pm \frac{\pi}{3}$ ✓ (۲)

ب) $2\sin^2 - 2 + \cos^2 - \sin\cos = 0 \rightarrow -\cos(\cos + \sin) = 0 \rightarrow \cos = 0 \rightarrow k\pi + \frac{\pi}{2}$; $\cos = -\sin \rightarrow k\pi - \frac{\pi}{4}$ ✓

۴) $\cos(\frac{\pi}{4} + x) \times \sin(\frac{\pi}{4} + x) = \frac{1}{4} \rightarrow \frac{1}{2}\sin(\frac{\pi}{2} + 2x) = \frac{1}{4} \rightarrow \cos 2x = \frac{1}{2}$

$x = k\pi \pm \frac{\pi}{6}$ ✓ (۲)

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

$2x - \frac{\pi}{9} = 2k\pi \pm (\frac{\pi}{2} + 2x) \rightarrow 2k\pi + \frac{\pi}{9} + \frac{\pi}{2} = 0$ ✗

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

$4x = 2k\pi - \frac{7\pi}{18} \rightarrow x = \frac{k\pi}{2} - \frac{7\pi}{72}$ ✓

۵) $\frac{\sin 4x - \sin 2x}{\sin 2x} = 1 \xrightarrow{\sin 2x \neq 0} \sin 4x + \sin 2x = \sin 2x$ (۲)

$\sin 4x = 0 \;,\; \sin 4x = 2\sin 2x \cos 2x$

$\sin 2x \neq 0 \rightarrow \cos 2x = 0 \rightarrow 2x = k\pi + \frac{\pi}{2} \rightarrow x = \frac{k\pi}{2} + \frac{\pi}{4}$ ✓

(۲) ۶) $\frac{\sin\frac{x}{2}}{1+\cos\frac{x}{2}} = \frac{\cos\frac{x}{2} + 1}{\sin\frac{x}{2}} \xrightarrow{\tan x = \frac{\sin 2x}{1+\cos 2x}} = \tan\frac{x}{4} = \cot\frac{x}{4}$

$x \in [-\pi, \frac{3\pi}{2}] \rightarrow x = -\pi, \pi \rightarrow |\pi - (-\pi)| = 2\pi$ ✓

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

(۲) $\sin^2 = 0 \rightarrow \sin = 0$; $1 + \cos 3x = 0 \rightarrow \cos 3x = -1 \rightarrow 3x = 2k\pi + \pi \rightarrow x = \frac{2k\pi}{3} + \frac{\pi}{3}$

جواب $x \in \{0, \frac{\pi}{3}, \pi, \frac{5\pi}{3}, 2\pi\}$ ✓

۸) $\tan(\frac{\pi}{4} - x) = \frac{\tan\frac{\pi}{4} - \tan x}{1 + \tan\frac{\pi}{4}\tan x} = \frac{1 - \tan}{1 + \tan}$

(۲) $\tan(\frac{\pi}{4} - x) = \tan 3x \rightarrow 3x = k\pi + \frac{\pi}{4} - x \rightarrow x = \frac{k\pi}{4} + \frac{\pi}{16}$ ✓

ملینا کیانی

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

$\sqrt{2}(\cos-\sin)(\cos+\sin) \xrightarrow{\sin+\cos\neq 0} \sqrt{2}|\sin-\cos| = 1$

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

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

$x-\frac{\pi}{4} = k\pi \pm \frac{\pi}{6} \rightarrow x = k\pi \pm \frac{\pi}{6} + \frac{\pi}{4} \xrightarrow{x\in[0,2\pi]}$ ✓

حواب ۲

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

$2\cos^2 x = 0 \rightarrow \cos = 0 \rightarrow x = \frac{\pi}{2}$ و $x = \frac{3\pi}{2}$ ✓

ب) $\sin^4-\cos^4 = -1 \rightarrow \sin^2+\cos^2 = 1$ و $\sin^2-\cos^2 = -1$

$x = 0$ و $x = \frac{\pi}{2}$ و $x = \pi$

$x = \frac{3\pi}{2}$ و $x = 2\pi$ ✓

$x \in \{0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi\}$