

الف) $-2\sin^2 x - 3\sin x + 2 = 0 \Rightarrow \sin x = -\frac{1}{2}$

$\Rightarrow \sin x = \frac{1}{2} \Rightarrow x = 2k\pi + \frac{\pi}{6} \text{ و } x = 2k\pi + \pi - \frac{\pi}{6}$

ب) $\Rightarrow x = 2k\pi + \frac{\omega\pi}{4} \begin{cases} 2\cos^2 x + \cos x - 3 = 0 \Rightarrow \cos x = 1 \\ \cos x = -\frac{3}{2} \\ \cos x = 1 \Rightarrow x = 2k\pi \end{cases}$

الف) $(\sin^2 x \cos^2 x)(\sin^2 x \cos^2 x) = 2\sin^2 x \cos^2 x \Rightarrow 2\sin^2 x \cos^2 x + \cos^2 x = 0$

$\cos^2 x (2\sin^2 x + 1) = 0 \Rightarrow \begin{cases} \cos^2 x = 0 \Rightarrow 2x = k\pi + \frac{\pi}{2} \Rightarrow x = \frac{k\pi}{2} + \frac{\pi}{4} \\ \sin^2 x = \frac{1}{2} \Rightarrow 2x = 2k\pi - \frac{\pi}{2} \Rightarrow x = k\pi - \frac{\pi}{4} \end{cases}$



ج) $2\cos^2 x - 1 + \sin^2 x \Rightarrow \cos^2 x + \sin^2 x = 0 \Rightarrow 2x = 2k\pi + \frac{\pi}{2} \Rightarrow x = k\pi + \frac{\pi}{4}$

$\Rightarrow 2\sin(2x + \frac{\pi}{4}) = 0 \Rightarrow \sin(2x + \frac{\pi}{4}) = 0 \Rightarrow 2x + \frac{\pi}{4} = k\pi \Rightarrow x = \frac{k\pi}{2} - \frac{\pi}{4}$

الف) $2\cos^2 x + \cos x - 1 = 0 \Rightarrow \begin{cases} \cos x = \frac{1}{2} \Rightarrow x = 2k\pi \pm \frac{\pi}{3} \\ \cos x = -1 \Rightarrow 2k\pi + \pi \end{cases}$ مخرج صفر

ب) $1 + \sin^2 x - \sin x \cos x = 2 \Rightarrow \frac{1 - \cos^2 x}{2} - \frac{\sin^2 x}{2} = 1$

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

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

الف) $\cos(x + \frac{\pi}{4}) \times \cos(\frac{\pi}{4} - x) = \frac{1}{2} \Rightarrow \sin(2x + \frac{\pi}{2}) = \frac{1}{2}$

$\sin(2x + \frac{\pi}{2}) \Rightarrow (\frac{1}{2} \sin(2x + \frac{\pi}{2})) = \frac{1}{2}$

$\Rightarrow \cos 2x = \frac{1}{2} \Rightarrow 2x = 2k\pi \pm \frac{\pi}{3} \Rightarrow x = k\pi \pm \frac{\pi}{6}$

$\cos(2x - \frac{\pi}{6}) = \cos(2x + \frac{\pi}{6}) \Rightarrow \begin{cases} 2x - \frac{\pi}{6} = 2k\pi + \frac{\pi}{6} + 2x \\ 2x - \frac{\pi}{6} = 2k\pi - \frac{\pi}{6} - 2x \end{cases}$

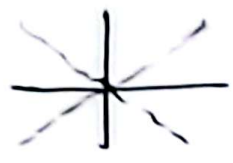
$x = \frac{k\pi}{2} - \frac{\pi}{4}$

$\frac{2\sin^2 x \cos^2 x + \sin^2 x}{\sin^2 x} = \cos^2 x + \sin^2 x \Rightarrow 2\cos^2 x + 1 = 1 \Rightarrow \cos^2 x = 0$

$\Rightarrow 2x = k\pi + \frac{\pi}{2} \Rightarrow x = \frac{k\pi}{2} + \frac{\pi}{4}$ (همه ی نقاط جواب در دامنه $(\sin^2 x + \cos^2 x)$ صدق می کند)

$$\tan\left(\frac{x}{2}\right) = \frac{1 + \cos x}{\sin x} \Rightarrow \tan\left(\frac{x}{2}\right) = \frac{1}{\tan\left(\frac{x}{2}\right)} \Rightarrow \tan^2\left(\frac{x}{2}\right) = 1$$

$$\tan\left(\frac{x}{2}\right) = \pm 1 \Rightarrow \frac{x}{2} = \frac{k\pi}{2} + \frac{\pi}{4} \Rightarrow \boxed{x = 2k\pi + \pi}$$

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

$$\left. \begin{array}{l} -\sin^2 x \cos^2 x = 1 - \cos^2 x \\ \sin^2 x (1 + \cos^2 x) = 0 \end{array} \right\} \rightarrow \begin{array}{l} \textcircled{1} \cos^2 x = 1 \Rightarrow x = 2k\pi \text{ or } x = (2k+1)\pi \\ \textcircled{2} \sin^2 x = 0 \Rightarrow x = k\pi \end{array}$$

$$\textcircled{1} \quad \begin{array}{c|c|c|c|c} k & 0 & 1 & 1 & 2 \\ \hline x & 0 & \pi & \pi & 2\pi \end{array}$$

$$\textcircled{2} \quad \begin{array}{c|c|c|c|c} k & 0 & 1 & 2 & 3 \\ \hline x & 0 & \pi & 2\pi & 3\pi \end{array} \quad \text{CJW}$$

مکمل جواب

$$\frac{1 - \tan x}{1 + \tan x} = \tan\left(\frac{\pi}{4} - x\right) = \tan^3 x \Rightarrow 3x = k\pi + \frac{\pi}{4} - x$$

$$x = \frac{k\pi}{4} + \frac{\pi}{14}$$

همین نقاط در دامنه صدق می کنند

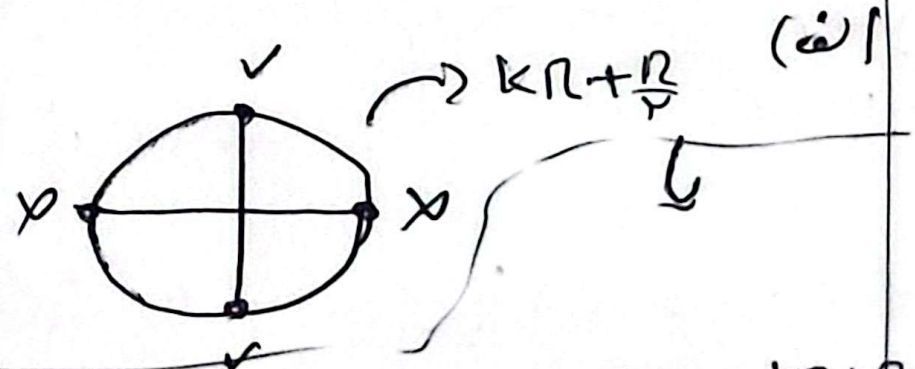
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$$x=0 \Rightarrow \sin^2 x - \cos^2 x = -1 \checkmark$$

$$\boxed{x = \frac{\pi}{2}} \Rightarrow 1 - 0 = 1 \times$$

$$x = \frac{3\pi}{2} \Rightarrow \cancel{0} + 1 = 1 \times$$

$$\boxed{x = \frac{3\pi}{2}} \Rightarrow -1 - 0 = -1 \checkmark$$



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

$$\Rightarrow [0, 2\pi] \Rightarrow x = \left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\}$$