

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

$\Rightarrow \sin x = \frac{1 \pm 0}{-1} = -1, \frac{1}{-1} \Rightarrow \sin x = \frac{1}{-1} \Rightarrow x = \left\{ k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2} \right\}$

(ب) $\cos^2 x - \sin^2 x \cos x - 1 = 0 \Rightarrow \cos^2 x - \sin^2 x \cos x - 1 = 0 \Rightarrow \cos^2 x \cos x - \sin^2 x \cos x - 1 = 0$

$\Rightarrow \cos x = \frac{1 \pm 0}{1} = 1, -1 \Rightarrow x = k\pi$

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

$\Rightarrow \sin^2 x = -\frac{1}{1} \Rightarrow x = \left\{ k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2} \right\}$

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

$\Rightarrow x = \left\{ k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4} \right\}$

(الف) $\frac{\cos(2x)}{\sin x} = \frac{1}{\sin x} \Rightarrow \cos^2 x - 1 = 0 \Rightarrow \cos^2 x = 1 \Rightarrow \cos x = \pm 1$

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

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

$\Rightarrow x = \left\{ k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4} \right\}$

(الف) $\left(\frac{\sqrt{3}}{2} \cos x - \frac{1}{2} \sin x \right) \left(\frac{\sqrt{3}}{2} \cos x + \frac{1}{2} \sin x \right) = \frac{1}{4} \Rightarrow \frac{1}{4} \cos^2 x - \frac{1}{4} \sin^2 x = \frac{1}{4}$

$\Rightarrow \cos^2 x = \frac{1}{1} \Rightarrow x = \left\{ k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2} \right\}$

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

$\sin\left(\frac{\pi}{2} - \left(x - \frac{\pi}{4}\right)\right) = -\sin x$

$\Rightarrow \sin^2 x = \frac{1}{4} \Rightarrow x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

$$\frac{\sin P_1 \cos P_2}{\sin P_1} = \sin P_2 \cos P_1 \Rightarrow \frac{\sin P_1 \cos P_2 \sin P_1}{\sin P_1} = \frac{\sin P_1 (\cos P_1)}{\sin P_1} \quad (1)$$

$$\Leftrightarrow \cos P_1 - \sin^2 P_1 = \sin P_2 \cos P_1 \Leftrightarrow \cos P_1 - \sin^2 P_1 = \sin P_2 \cos P_1 \Rightarrow \sin P_2 = \frac{\cos P_1 (1 - \sin^2 P_1)}{\cos P_1} = \cos P_1 \Rightarrow \sin P_2 = \cos P_1 \Rightarrow \{k\pi + \frac{\pi}{2}\}$$

$$\tan \frac{\pi}{2} = \frac{\sin \frac{\pi}{2}}{\cos \frac{\pi}{2}} \Rightarrow \frac{\sin \frac{\pi}{2}}{\cos \frac{\pi}{2}} = \frac{\tan \frac{\pi}{2}}{\frac{\tan \frac{\pi}{2}}{\tan \frac{\pi}{2}}} \Rightarrow \tan \frac{\pi}{2} = \tan \frac{\pi}{2} \Rightarrow \alpha = \frac{\pi}{2} \Rightarrow \pi \quad (1.5)$$

$$-\sin P_1' (\cos P_2) = 0 \Rightarrow \begin{cases} \sin P_2 = 0 \Rightarrow \sin P_2 = 0 \Rightarrow P_2 = k\pi \\ \cos P_2 = 1 \Rightarrow P_2 = 2k\pi \end{cases} \Rightarrow \frac{\pi}{2} \quad (1.8)$$

$$\tan \frac{\pi}{2} = 1 \Rightarrow \frac{1 - \tan u}{1 + \tan u} = \tan(\frac{\pi}{2} - u)$$

$$\tan(\frac{\pi}{2} - u) = \tan u \Rightarrow \frac{\pi}{2} - u = k\pi + u$$

$$-u = k\pi - \frac{\pi}{2} \xrightarrow{-k\pi = k\pi} u = k\pi + \frac{\pi}{2}$$

$$u = \frac{k\pi}{2} + \frac{\pi}{4}$$

$$\sin P_1 \cos P_2 = \cos P_1 \sin P_2 \Rightarrow \sin P_1 = \cos P_1 \Rightarrow \sin P_1 = \frac{1}{\sqrt{2}} \Rightarrow P_1 = \frac{\pi}{4}, \frac{3\pi}{4} \quad (1.9)$$

$$1) \sin P_1 - \cos P_2 = 1 \Rightarrow -\cos P_2 = 1 \Rightarrow \cos P_2 = -1 \Rightarrow P_2 = \{k\pi + \pi\} \quad (1.10)$$

$$\begin{cases} \sin P_1 = \cos P_2 \\ \sin P_1 = 1 \cos P_2 = 0 \end{cases} \Rightarrow P_1 = \{0, \frac{\pi}{2}, \pi\}$$

$$\frac{\sin \frac{\pi}{2}}{1 + \cos \frac{\pi}{2}} = \tan \frac{\pi}{2}$$

سوال 4

$$\frac{1}{\sin \frac{\pi}{2}} + \cot \frac{\pi}{2} = \frac{1 + \cos \frac{\pi}{2}}{\sin \frac{\pi}{2}} = \frac{1}{\tan \frac{\pi}{2}} = \cot \frac{\pi}{2}$$

$$\tan \frac{\pi}{2} = \cot \frac{\pi}{2} \rightarrow \tan \frac{\pi}{2} = \tan \left(\frac{\pi}{2} - \frac{\pi}{2} \right)$$

$$\frac{\pi}{2} = k\pi + \frac{\pi}{2} - \frac{\pi}{2} \rightarrow \frac{\pi}{2} = k\pi + \frac{\pi}{2} \rightarrow \pi = 2k\pi + \pi$$

$$\text{جواب ها} \rightarrow k=0 \rightarrow \pi = \pi$$

$$\rightarrow k=-1 \rightarrow \pi = -\pi \rightarrow \text{افزاد} = |\pi - (-\pi)| = 2\pi$$

سوال 5

$$\cos^2 u - \sin^2 u \cos^2 u = 1 \quad \xrightarrow{\cos^2 u = 1 - \sin^2 u}$$

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

$$\sin u = 0 \rightarrow u = k\pi \rightarrow u = 0, \pi, 2\pi$$

$$\rightarrow \cos^2 u = 1$$

$$\cos^2 u = 1 \rightarrow u = 2k\pi + \pi \rightarrow u = \frac{2k\pi + \pi}{2} \rightarrow u = \frac{\pi}{2}, \frac{3\pi}{2}$$

مقادیر 5 جواب دارد

