

۱۳,۲۵

نام و نام خانوادگی (پسر/دختر) پاسخنامه تشریحی تکلیف شماره کلاس

الف) $\cos 2x = 2\sin x - 1$

$\sin x = \frac{1 - \cos 2x}{2} \Rightarrow \cos 2x = 1 - 2\sin^2 x$ $\Rightarrow \frac{-2 \pm \sqrt{4 - 4}}{2 \times 1} = \frac{-2}{2} = -1 \rightarrow \sin x$

$\sin(x) = \frac{1}{2}$ $\Rightarrow x = 2k\pi + \frac{\pi}{6}, x = 2k\pi + \pi - \frac{\pi}{6} \Rightarrow x = 2k\pi + \frac{5\pi}{6}$

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

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

ب) $2\cos^2 x - 1 = -2\sin x \cdot \cos x$ $\xrightarrow{\cos x \neq 0}$ $\cos x = -\sin x \Rightarrow \cos x = \sin(\frac{\pi}{2} - x)$ $\Rightarrow x = \frac{\pi}{4}$
 $\cos x = -\sin x \Rightarrow \cos x = \sin(\frac{\pi}{2} - x)$ $\Rightarrow x = \frac{\pi}{4}$

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

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

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

ب) $\cos(x - \frac{\pi}{4}) = \cos(\frac{\pi}{4} - x)$ $\xrightarrow{x - \frac{\pi}{4} = 2k\pi + \frac{\pi}{4} - x}$ $x = k\pi + \frac{\pi}{4}$
 $x - \frac{\pi}{4} = 2k\pi + \pi + \frac{\pi}{4} - x \Rightarrow x = k\pi + \frac{3\pi}{4}$

$\Rightarrow \frac{2\sin^2 x \cdot \cos^2 x + \sin^2 x}{\sin 2x} = \frac{\sin^2 x}{\sin 2x} + \frac{\cos^2 x}{\sin 2x} \Rightarrow \frac{\sin^2 x (2\cos^2 x + 1)}{\sin 2x} = 1$
 $2\cos^2 x + 1 = \frac{1}{\sin x} \Rightarrow \cos^2 x = 0 \Rightarrow x = k\pi + \frac{\pi}{2}$
 $\Rightarrow x = \frac{k\pi}{2} + \frac{\pi}{2}$

$$k=0 \rightarrow a=\pi$$

$$k=-1 \rightarrow a=-\pi$$

$$|-1-\pi| = k_2$$

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

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

$$\Rightarrow \cos x = \frac{1}{1+\cos x} \Rightarrow \cos x (1+\cos x) = 1$$

$$\Rightarrow \cos x + \cos^2 x = 1 \Rightarrow \cos^2 x + \cos x - 1 = 0$$

$$\cos x = \frac{-1 \pm \sqrt{1+4}}{2} = \frac{-1 \pm \sqrt{5}}{2}$$

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

$$k=1 \Rightarrow \pi + \frac{\pi}{2} = \frac{3\pi}{2}$$

$$k=0 \Rightarrow 0 - \frac{\pi}{2} = -\frac{\pi}{2}$$

$$\frac{3\pi}{2} - \frac{\pi}{2} = \pi$$

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

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

$$\sin^2 x = 0 \Rightarrow x = k\pi \rightarrow 0, \pi, k$$

$$\cos x = -1 \Rightarrow x = 2k\pi + \pi$$

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

$$\frac{\pi}{2}, \pi, \frac{3\pi}{2}$$

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

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

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

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

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

$$\Rightarrow \cos\left(\frac{\pi}{2} - x\right) = \cos(x) \Rightarrow x = 2k\pi + \frac{\pi}{2} - x$$

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

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

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

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

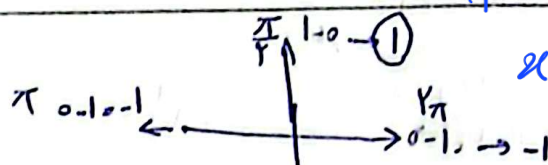
$$a) \sin^2 x - \cos^2 x = 1$$

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

$$b) \sin^2 x - \cos^2 x = -1$$

$$x \rightarrow 2k\pi$$

$$x \rightarrow 2k\pi - \frac{\pi}{2}$$



$$1-0=1 \Rightarrow \frac{\pi}{4}$$

