سلام خسته نباشید

با توجه به اینکه هفته قبل تکالیف را اشتباهی بارگزاری کردم. اینهفته تکالیف سری ۱۶ و ۱۷ را هم بارگزاری کردم. لطفا اگه برای شما مقدور است تکالیف سری ۱۶ هم برای من تصحیح کنید و نمره اش را ثبت کنید. متشکرم

نام و نام خانوادگی علیرضا نوروزی پاسخنامه تشریحی تکلیف شماره ۱۶ کلاس A (ریاضی)

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

$\sin^2x+3\sin x-4=0 \longrightarrow \sin x=-2 \times$

$\longrightarrow \sin x=\frac{1}{2} \longrightarrow x=2k\pi+\frac{\pi}{6} \quad x=2k\pi+\pi-\frac{\pi}{6}$ ۱

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

$a+b+c=0 \begin{cases}\cos x=+1 \longrightarrow x=2k\pi \\ \cos x=\frac{-3}{2} \times\end{cases}$

الف) $\cos(2x)=-\sin(4x) \longrightarrow \cancel{\cos(2x)}=-2\sin(2x)\cancel{\cos(2x)}$

$\begin{cases}\cos(2x)=0 \longrightarrow 2x=k\pi+\frac{\pi}{2} \longrightarrow x=\frac{k\pi}{2}+\frac{\pi}{4} \\ \sin(2x)=\frac{-1}{2} \longrightarrow 2x=2k\pi-\frac{\pi}{6} \quad 2x=2k\pi+\pi+\frac{\pi}{6}\end{cases}$ $x=k\pi-\frac{\pi}{12}$, $x=k\pi+\frac{5\pi}{12}$

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

$\tan(2x)=-1 \longrightarrow 2x=k\pi-\frac{\pi}{4} \longrightarrow x=\frac{k\pi}{2}-\frac{\pi}{8}$ ۲

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

$x=2k\pi+\pi \qquad x=2k\pi\pm\frac{\pi}{3}$ ۳

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

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

الف) $\left(\cos x\cos\frac{\pi}{4}-\sin x\sin\frac{\pi}{4}\right)\left(\cos\frac{\pi}{4}\cos x+\sin x\sin\frac{\pi}{4}\right)=\frac{1}{4}$

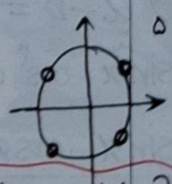
$\frac{1}{2}\cos^2x-\frac{1}{2}\sin^2x=\frac{1}{4} \longrightarrow \cos(2x)=\frac{1}{2} \longrightarrow 2x=2k\pi\pm\frac{\pi}{3} \longrightarrow x=k\pi\pm\frac{\pi}{6}$ ۴

ب) $\cos\left(2x-\frac{\pi}{9}\right)=\cos\left(\frac{\pi}{2}+2x\right) \longrightarrow 2x-\frac{\pi}{9}=2k\pi+\frac{\pi}{2}+2x \otimes$

$\longrightarrow 2x-\frac{\pi}{9}=2k\pi-2x-\frac{\pi}{2} \longrightarrow x=\frac{k\pi}{2}-\frac{7\pi}{72}$

$\frac{2\cancel{\sin(2x)}\cos(2x)+\cancel{\sin(2x)}}{\cancel{\sin(2x)}}=\overset{1}{\cancel{\sin^2x+\cos^2x}} \longrightarrow 2\cos(2x)+1=1$ ۵

$\cos(2x)=0 \longrightarrow 2x=k\pi+\frac{\pi}{2} \longrightarrow x=\frac{k\pi}{2}+\frac{\pi}{4}$



جواب $=\left\{\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}\right\}$

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

$$\frac{1-\cos x}{2}-\frac{1+\cos x}{2}=2\cos\left(\frac{x}{2}\right)+1\rightarrow -\cos x=2\cos\left(\frac{x}{2}\right)+1$$

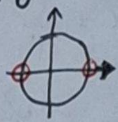
۶ α

$$\cos^2\left(\frac{x}{2}\right)-\sin^2\left(\frac{x}{2}\right)=-2\cos\left(\frac{x}{2}\right)-1\longrightarrow 2\cos^2\left(\frac{x}{2}\right)=-2\cos\left(\frac{x}{2}\right)\begin{cases}\cos\left(\frac{x}{2}\right)=0\\ \cos\left(\frac{x}{2}\right)=-1\end{cases}$$

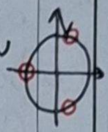
$$x_1=2k\pi+\pi \quad x_2=4k\pi+2\pi\rightarrow |x_2-x_1|=2k\pi+\pi$$

$$1-\sin^2 x-\sin^2 x\cos^3 x=1\longrightarrow \sin^2 x\left(1+\cos^3 x\right)=0$$

$\sin^2 x=0\longrightarrow \sin x=0\rightarrow x=k\pi\rightarrow$ ۲ جواب



$\cos^3 x=-1\rightarrow 3x=2k\pi+\pi\rightarrow x=\frac{2k\pi}{3}+\frac{\pi}{3}\rightarrow$ ۳ جواب



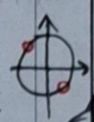
جمعاً معادله در بازه $[0, 2\pi]$ دارای ۵ جواب است.

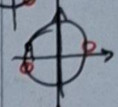
$$\tan\left(\frac{\pi}{4}-x\right)=\tan(3x)\longrightarrow \frac{\pi}{4}-x=k\pi+3x\rightarrow x=\frac{-k\pi}{4}+\frac{\pi}{16}$$

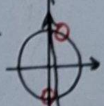
$$\frac{1-\tan x}{1+\tan x}=\frac{\tan\left(\frac{\pi}{4}\right)-\tan x}{1+\tan x\tan\left(\frac{\pi}{4}\right)}=\tan\left(\frac{\pi}{4}-x\right)$$ ۸

$\xrightarrow{\text{توان ۲}}\ 1+\sin(2x)=2\cos^2(2x)\longrightarrow 1+\sin(2x)=2-2\sin^2(2x)$

$$2\sin^2(2x)+\sin(2x)-1=0\begin{cases}\sin(2x)=-1\rightarrow x=k\pi-\frac{\pi}{4}\\ \sin(2x)=\frac{1}{2}\begin{cases}x=k\pi+\frac{\pi}{12}\\ x=k\pi+\frac{5\pi}{12}\end{cases}\end{cases}$$







جمعاً در بازه $[0, \pi]$ دارای ۳ جواب است.

الف) $-\cos(2x)=1\longrightarrow \cos(2x)=-1\rightarrow 2x=2k\pi+\pi$

$x=k\pi+\frac{\pi}{2}$  $\rightarrow x=\frac{\pi}{2},\frac{3\pi}{2}$

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

نام و نام خانوادگی ...علیرضا نوروزی... پاسخنامه تشریحی تکلیف شماره ..۱۷.. کلاس ..A (شنبه)..

۱۵

$8\cos x - \frac{\sin^2 x}{\cos^2 x} = 1 \to \frac{8\cos^3 x - \sin^2 x}{\cos^2 x} = 1 \to 8\cos^3 x = \cancel{\sin^2 x + \cos^2 x}$ 1

$\cos x = \frac{1}{2} \to x = 2k\pi \pm \frac{\pi}{3} \to$ ۲ جواب ✓ ۱

۲ ✓

$\cos^2 \frac{3x}{2} = \frac{1+\cos 3x}{2}$

$5\sin^2 x + 2(2\cos^2\frac{3x}{2} - 1) = -2$ ۰ ۲

$5\sin^2 x + 4\cos^2\frac{3x}{2} = 0 \longrightarrow$ دو عبارت ناشی صفر شده است هر عبارت صفر است

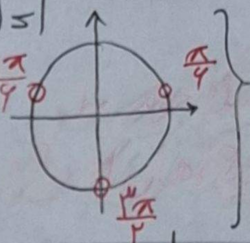
$\sin x = k\pi$

$\cos^2\frac{3x}{2}$, $x = k\pi + \frac{\pi}{3} \to -\pi , \pi$

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

$2\sin(x) - 4\sin^3(x) + \sin(x) = 1 \to \sin(3x) = 1$

$3x = 2k\pi + \frac{\pi}{2} \to x = \frac{2k\pi}{3} + \frac{\pi}{6}$



$\xrightarrow{\oplus} \frac{5\pi}{2}$ ۳

۲ ✓

$\frac{1}{\sin(\frac{\pi}{2}+2x)} + \frac{1}{\cos(\frac{\pi}{2}+4x)} = 0 \to \frac{1}{\cos(2x)} = \frac{1}{\sin(4x)}$

$\cos(2x) = 2\sin(2x)\cos(2x) \to \sin(2x) = \frac{1}{2} / \cos(2x) = 0$

$x = \frac{3\pi}{4}$, $x = \frac{\pi}{4}$, $x = \frac{\pi}{12}$, $x = \frac{5\pi}{12}$

$x = x_2 - x_1$

$\frac{3\pi}{4} - \frac{5\pi}{12} = \frac{\pi}{3} \to \tan(\frac{2\pi}{3}) = -\sqrt{3}$

$\frac{\pi}{4} - \frac{\pi}{12} = \frac{\pi}{6} \to \tan(\frac{\pi}{3}) = \sqrt{3}$

۲ ✓

$\cos(x + \frac{\pi}{4}) = \frac{1}{\sqrt{3}} \xrightarrow{\text{توان ۲}} \frac{1+\cos(\frac{\pi}{2}+2x)}{2} = \frac{1}{3} \to -\sin(2x) = \frac{-1}{3} \to \sin(2x) = \frac{1}{3}$

$m(\cos x - \sin x) - \frac{2\sqrt{6}}{3} = \sqrt{6} \to \sin x - \cos x = \frac{2\sqrt{6}}{-m} \to \sqrt{2}\sin(x - \frac{\pi}{4}) = \frac{2\sqrt{6}}{-m}$

$\xrightarrow{\text{توان ۲}} \sin^2(x - \frac{\pi}{4}) = \frac{12}{m^2} \to \frac{1-\cos(\frac{\pi}{2}-2x)}{2} = \frac{12}{m^2} \to \frac{1-\cancel{\sin(2x)}\frac{1}{3}}{2} = \frac{12}{m^2}$

$\frac{1}{3} = \frac{12}{m^2} \to m^2 = 36 \to m = \pm 6$ ۱/۵

$\cos x - \sin x = \frac{\sqrt{6}}{3} \xrightarrow{\text{توان ۲}} \cos^2 x + \sin^2 x - \sin 2x = \frac{6}{9}$

$m \times \frac{\sqrt{6}}{3} - 2\sqrt{6} \times \frac{1}{3} = \sqrt{6} \to m = 6$

$$\left(\sin x\cos\frac{\pi}{4}+\sin\frac{\pi}{4}\cos x\right)\left(\cos x\cos\frac{\pi}{3}+\sin x\sin\frac{\pi}{3}\right)=1$$ ۲

$$\left(\frac{\sqrt{3}}{2}\sin x+\frac{1}{2}\cos x\right)^2=1 \xrightarrow{\frac{a}{|a|}\sqrt{a^2+b^2}\sin(x+\alpha)} \left(\sin\left(x+\frac{\pi}{6}\right)\right)^2=1$$ ۶

$$\begin{cases}\sin(x+\frac{\pi}{6})=1 \to x+\frac{\pi}{6}=2k\pi+\frac{\pi}{2} \to x=2k\pi+\frac{\pi}{3} \to \frac{\pi}{3}=x \\ \sin(x+\frac{\pi}{6})=-1 \to x+\frac{\pi}{6}=2k\pi-\frac{\pi}{2} \to x=2k\pi-\frac{2\pi}{3} \to \frac{-2\pi}{3}=x\end{cases}$$ جواب

$$a\sin x+b\cos x=\frac{a}{|a|}\sqrt{a^2+b^2}\sin(x+\alpha)$$

$$\sin x+\sqrt{3}\cos x=\sqrt{2} \to \sqrt{4}\sin\left(x+\frac{\pi}{3}\right)=\sqrt{2} \to \sin\left(x+\frac{\pi}{3}\right)=\frac{\sqrt{2}}{2}$$ ۷

$$\begin{cases}x+\frac{\pi}{3}=2k\pi+\frac{\pi}{4} \longrightarrow x=2k\pi-\frac{\pi}{12} \\ x+\frac{\pi}{3}=2k\pi+\pi-\frac{\pi}{4} \to x=2k\pi+\frac{5\pi}{12}\end{cases} x\in[-\pi,2\pi] \to \frac{-\pi}{12}, \frac{5\pi}{12}, \frac{23\pi}{12}$$ $\oplus$ $\frac{27\pi}{12}$

۲ ✓

$$\sin\left(\frac{3\pi}{2}-x\right)=-\cos x \longrightarrow 4\sin x\cos x=-1 \to 2\sin(2x)=-1$$

۳/۰/⊖ عوض شود $\qquad \sin(2x)=\frac{-1}{2}$ $\qquad$ ۱,۷۵

$$\begin{cases}2x=2k\pi-\frac{\pi}{6} \longrightarrow x=k\pi-\frac{\pi}{12} \to x=\frac{23\pi}{12}, \frac{11\pi}{12} \\ 2x=2k\pi+\pi+\frac{\pi}{6} \to x=k\pi+\frac{7\pi}{12} \to x=\frac{7\pi}{12}, \frac{19\pi}{12}\end{cases} \oplus \to 5\pi$$ ۸

$$\cos^2(x)=\frac{1+\cos 2x}{2} \longrightarrow 8\cos^2(x)\cos^2(2x)\cos^2(4x)=\frac{1}{8}$$ جذر

$$\cos(x)\cos(2x)\cos(4x)=\pm\frac{1}{8} \to \frac{\times\sin a}{\cancel{\sin a \neq}}$$ پس هر کدام $\to x=\frac{\pi}{3}, \frac{-\pi}{3}$; $x=\frac{\pi}{4}, \frac{-\pi}{4}$; $x=\frac{\pi}{12}, \frac{-\pi}{12}$ ۹

$$A=\left\{\pm\frac{\pi}{3}, \pm\frac{\pi}{4}, \pm\frac{\pi}{12}\right\} \longrightarrow \cancel{Max_A=\frac{\pi}{3}}$$ ۰,۷۵

$\sin 8\alpha = \pm\sin\alpha \to \max A = \frac{8\pi}{9}$ $\qquad$ ناقص

$$\tan(3x)=\frac{1}{\tan(x)} \longrightarrow \cot\left(\frac{\pi}{2}-3x\right)=\cot(x) \to \frac{\pi}{2}-3x=k\pi+x$$

$$4x=\frac{\pi}{2}-k\pi \longrightarrow x=\frac{-k\pi}{4}+\frac{\pi}{8}$$ ۱۰

$k=0 \to \frac{\pi}{8}$

$k=1 \to \frac{-\pi}{8}$ $\quad \oplus \longrightarrow \cancel{\frac{-10\pi}{8}-\frac{-5\pi}{4}}$ $\qquad$ ۱

$k=2 \to \frac{-\pi}{2}+\frac{\pi}{8}$

$k=3 \to \frac{-3\pi}{4}+\frac{\pi}{8}$

$k=4 \to -\pi+\frac{\pi}{8}$

بازه $[\pi, 2\pi]$ $\quad$ جنس $\quad 9\pi$

$k=4 \qquad k=6$

$k=5 \qquad k=7$ $\quad \left\{\frac{9\pi}{8}+\frac{11\pi}{8}+\frac{13\pi}{8}+\frac{15\pi}{8}\right.$