نام و نام خانوادگی .....

پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

۱

$\Lambda\cos x - \tan^2 x = 1 \longrightarrow \Lambda\cos x = 1 + \tan^2 x \longrightarrow \Lambda\cos x = \frac{1}{\cos^2 x}$

$\Lambda\cos^3 x = 1 \longrightarrow \cos x = \frac{1}{2} \longrightarrow 2k\pi \pm \frac{\pi}{3}$

$\therefore$

۲

$\Delta\sin^2 x + 2\cos(2x) = -2 \longrightarrow \Delta - \Delta\cos^2 x + \Lambda\cos^2 x - 4\cos x = -2$

$(1-\cos^2 x)$ $\quad 2\cos^2 x - 1$

$\Lambda\cos^2 x - \Delta\cos^2 x - 4\cos x + 7 = 0 \longrightarrow (\cos x + 1)(\Lambda\cos^2 x - 12\cos x + 7) = 0$

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

۳

$2\sin(x)\cos(2x) + \sin x = 1 \longrightarrow \sin x(2\cos 2x + 1) = 1$

$2\cos^2 x - 2\sin^2 x + \sin^2 x + \cos^2 x$

$\sin x(3\cos^2 x - \sin^2 x) = 1$

$(1-\sin^2 x)$

$\sin x(3 - 4\sin^2 x) = 1 \longrightarrow 3\sin x - 4\sin^3 x - 1 = 0 \longrightarrow \sin(3x) - 1 = 0$

$\sin(3x)$

$3x = 2k\pi + \frac{\pi}{2} \rightarrow x = \frac{2k\pi}{3} + \frac{\pi}{6} \rightsquigarrow \frac{\pi}{6}, \frac{5\pi}{6}, \frac{9\pi}{6} \rightsquigarrow \pi + \frac{3\pi}{2}$ $\quad \frac{5\pi}{2}$

۴

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

$-2\sin(2x)\cos(2x)$

$\frac{\cos 2x - 2\sin(2x)\cos(2x)}{-2\sin(2x)\cos(2x)^2} = 0 \longrightarrow \cos(2x) - 2\sin(2x)\cos(2x) = 0$

$\cos(2x)(1 - 2\sin(2x)) = 0$ $\quad \cos 2\alpha = 0 \longrightarrow$?

۵

$\cos(x + \frac{\pi}{6}) = \frac{\sqrt{3}}{3} \rightsquigarrow \sin 2\alpha = \frac{2}{3}$

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

$\frac{\sqrt{2}m}{\sqrt{2}} - 3\sqrt{6}\sin(2x)\frac{2}{3} \longrightarrow \frac{\sqrt{2}}{\sqrt{2}}\cdot m - 2\sqrt{6} = \sqrt{6} \longrightarrow \frac{m\sqrt{6} - 2\sqrt{6}}{3} = \sqrt{6}$

$3\sqrt{6}$ ، $m\sqrt{6} - 2\sqrt{6} \longrightarrow m = 5$

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

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

$\sin^2\left(x+\frac{\pi}{4}\right)=1 \rightarrow \sin\left(x+\frac{\pi}{4}\right)=\pm 1 \rightarrow$ $x=2k\pi+\frac{\pi}{4}$, $x=2k\pi+\frac{5\pi}{4}$

۶

۲-۱

$\sin x+\sqrt{3}\cos x=\sqrt{2}$

$\sqrt{1+3}\sin(x+\theta) \rightarrow 2\sin\left(x+\frac{\pi}{3}\right)=\sqrt{2} \rightarrow \sin\left(x+\frac{\pi}{3}\right)=\frac{\sqrt{2}}{2}$

$\tan\theta=\sqrt{3} \rightarrow \theta=60^\circ=\frac{\pi}{3}$

$x=-\frac{\pi}{12}+2k\pi$, $x=\frac{23\pi}{12}+2k\pi \rightarrow$

$\frac{9\pi}{4}$

۷

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

$\rightarrow -2\sin(2x)=1 \rightarrow \sin 2x=-\frac{1}{2} \rightarrow x=k\pi+\frac{7\pi}{12}$ یا $k\pi+\frac{11\pi}{12}$

$\frac{7\pi}{12}$ و $\frac{11\pi}{12}$ و $\frac{19\pi}{12}$ و $\frac{23\pi}{12} \rightarrow$ (۴تا)

۸

$(1+\cos 2\alpha)(1+\cos 4\alpha)(1+\cos 8\alpha)=$

$\cos^2\alpha \times \cos^2 2\alpha \times \cos^2 4\alpha=\frac{1}{16}$

$(2\cos^2\alpha)\times(2\cos^2 2\alpha)\times(2\cos^2 4\alpha)=\frac{1}{8}\times\frac{2\sin^2 8\alpha}{2\sin^2\alpha} \rightarrow 2\sin^2\alpha\cos^2\alpha\times 2\cos^2 2\alpha\times 2\cos^2 4\alpha=\frac{2\sin^2 8\alpha}{8}$

$\rightarrow \frac{1}{8}\sin^2 8\alpha=\frac{\sin^2\alpha}{8} \rightarrow \sin^2 8\alpha=\sin^2\alpha \rightarrow 8\alpha=k\pi\pm\alpha$

$\alpha=\frac{k\pi}{7}$, $\alpha=\frac{k\pi}{9}$ $\quad$ $\alpha=\frac{k\pi}{9}$

۹

$\tan(2\alpha)\tan(\alpha)=1 \rightarrow 1-\tan(2\alpha)\tan(\alpha)=0$

$\tan 3\alpha=\frac{\tan\alpha+\tan 2\alpha}{1-\tan 2\alpha\tan\alpha} \rightarrow \tan 3\alpha=\frac{\sin 3\alpha}{\cos 3\alpha}$

$\rightarrow \cos 3\alpha=0 \rightarrow 3\alpha=k\pi+\frac{\pi}{2} \rightarrow \alpha=\frac{k\pi}{3}+\frac{\pi}{6}$

$\frac{\pi}{6}+\frac{4\pi}{6}+\frac{7\pi}{6}+\frac{10\pi}{6}=\frac{22\pi}{6}<4\pi$ (۴تا)

۱۰