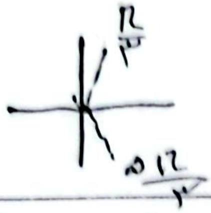
نام و نام خانوادگی ......علی سامع...... پاسخنامه تشریحی تکلیف شماره ...۱۷... کلاس ...یازدهم ۸...

۱

$8\cos x = 1+\tan^2 x = \frac{1}{\cos^2 x} \Rightarrow 8\cos^3 x = 1 \Rightarrow \cos x = \frac{1}{2}$

$\Rightarrow x = 2k\pi \pm \frac{\pi}{3} \Rightarrow \Rightarrow \boxed{x = \{\frac{\pi}{3}, \frac{5\pi}{3}\}}$



$\boxed{\text{۲ جواب}}$

۲

$5(1-\cos^2 x) + 2(4\cos^3 x - 3\cos x) = -2 \Rightarrow 5 - 5\cos^2 x + 8\cos^3 x$

$-6\cos x + 2 \Rightarrow 8\cos^3 x - 5\cos^2 x - 6\cos x + 7 = 0$

$\Rightarrow 8t^3 - 5t^2 - 6t + 7 = 0 \Rightarrow (t+1)(8t^2 - 13t + 7) = 0$

$\Delta < 0$

$\Rightarrow \cos x = -1 \Rightarrow \boxed{x = \{-\pi, \pi\}}$

$x \in [-\pi, \pi]$

$\boxed{\text{۲ جواب}}$

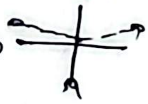
۳

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

$\Rightarrow -4t^3 + 3t - 1 = 0 \Rightarrow (t+1)(-4t^2 + 4t - 1) = 0$

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

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



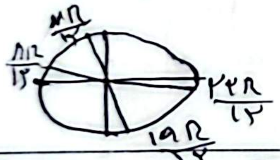
$\Rightarrow$ ۳ جواب $\{\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}\}$

۴

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

$\Rightarrow 2\sin 2x + 1 = 0 \Rightarrow \sin 2x = -\frac{1}{2} \Rightarrow$ ① $2x = 2k\pi + \frac{7\pi}{6} \Rightarrow x = k\pi + \frac{7\pi}{12}$

② $2x = 2k\pi + \frac{11\pi}{6} \Rightarrow x = k\pi + \frac{11\pi}{12}$



$\Rightarrow \frac{11\pi}{12} - \frac{7\pi}{12} = \frac{4\pi}{12} = \frac{\pi}{3} = \alpha \Rightarrow \tan 2\alpha = \boxed{\tan\frac{2\pi}{3} = -\sqrt{3}}$

۵

$* \cos x - \sin x = \sqrt{2}\cos(x+\frac{\pi}{4}) \Rightarrow x + \frac{\pi}{4} = t \Rightarrow \sin 2x = \sin(2t - \frac{\pi}{2}) = -\cos 2t$

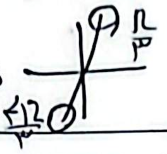
$\Rightarrow m\sqrt{2}\cos t + 2\sqrt{6}\cos 2t = \sqrt{6} \Rightarrow \cos 2t = 2\cos^2 t - 1 = \frac{2}{3} - 1 = -\frac{1}{3}$

$\frac{m\sqrt{2}}{\sqrt{3}} - \sqrt{6} = \sqrt{6} \Rightarrow \frac{m\sqrt{2}}{\sqrt{3}} = 2\sqrt{6} \Rightarrow m = \frac{2\sqrt{6} \times \sqrt{3}}{\sqrt{2}} = 6 \Rightarrow \boxed{m = 6}$

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

متمم $\Rightarrow \sin(x+\frac{\pi}{4})\times\sin(x+\frac{\pi}{4})=1 \Rightarrow \sin^2(x+\frac{\pi}{4})=1$ ۶

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

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

$a\sin x+b\cos x=\frac{a}{|a|}\sqrt{a^2+b^2}\,\sin(x+\alpha) \;\Big|\; \tan\alpha=\frac{b}{a} \Rightarrow \alpha=\sqrt{3}$

$\Rightarrow \sin x+\sqrt{3}\cos x=2\sin(x+\frac{\pi}{3})=\sqrt{3} \Rightarrow \sin(x+\frac{\pi}{3})=\frac{\sqrt{3}}{2}$ ۷

$\Rightarrow x+\frac{\pi}{3}=2k\pi+\frac{\pi}{4} \rightarrow x=2k\pi-\frac{\pi}{12} \Rightarrow x=\{-\frac{\pi}{12}, \frac{23\pi}{12}\}$

$x+\frac{\pi}{3}=2k\pi+\frac{3\pi}{4} \Rightarrow x=\{\frac{5\pi}{12}\} \Rightarrow$ مجموع $=\frac{24\pi+5\pi-\pi}{12}=\boxed{\frac{27\pi}{12}=\frac{9\pi}{4}}$

$x=2k\pi+\frac{5\pi}{12}$

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

(1) $2x=2k\pi+\frac{7\pi}{6} \Rightarrow x=k\pi+\frac{7\pi}{12}$ (2) $2x=2k\pi+\frac{11\pi}{6} \Rightarrow x=k\pi+\frac{11\pi}{12}$

(1)

k	0	1
x	$\frac{7\pi}{12}$	$\frac{19\pi}{12}$

(2)

k	0	1
x	$\frac{11\pi}{12}$	$\frac{23\pi}{12}$

$\Rightarrow$ ۸

مجموع $=\frac{7\pi+11\pi+19\pi+23\pi}{12}=\frac{60\pi}{12}=\boxed{5\pi}$

$=2\cos^2\alpha\times 2\cos^2 2\alpha\times 2\cos^2 4\alpha=8\cos^2\alpha\cos^2 2\alpha\cos^2 4\alpha=\frac{1}{8}$

$\Rightarrow(\cos\alpha\cos 2\alpha\cos 4\alpha)^2=\frac{1}{64} \times\frac{\sin\alpha}{\sin\alpha}=\Big(\frac{\overbrace{\underbrace{\sin\alpha\cos\alpha}_{\frac{1}{2}\sin 2\alpha}\cos 2\alpha}^{\frac{1}{4}\sin 4\alpha}\cos 4\alpha}{\sin\alpha}\Big)^2=\frac{1}{64}$ ($\frac{1}{8}\sin 8\alpha$)

$\Rightarrow\left(\frac{\sin 8\alpha}{8\sin\alpha}\right)^2=\frac{1}{64} \Rightarrow |\sin 8\alpha|=|\sin\alpha|$ ۹

$\sin 8\alpha=\sin\alpha \rightarrow x=\frac{2k\pi}{7}$, $x=\frac{2k\pi+\pi}{9}$

$\sin 8\alpha=-\sin\alpha \rightarrow x=\frac{2k\pi}{9}$, $x=\frac{2k\pi+\pi}{7}$

$\Rightarrow$ بزرگترین عضو $A=\frac{8\pi}{9}$ $\Rightarrow A=\{\frac{\pi}{9}, \frac{\pi}{7}, \frac{2\pi}{9}, \frac{2\pi}{7}, \frac{\pi}{3}, \frac{3\pi}{7}, \frac{4\pi}{9}, \frac{5\pi}{9}, \frac{4\pi}{7}, \frac{6\pi}{9}, \frac{5\pi}{7}, \frac{7\pi}{9}, \frac{6\pi}{7}, \frac{8\pi}{9}\}$

$\tan(3x)\tan x=1 \Rightarrow \frac{\sin 3x}{\cos 3x}\times\frac{\sin x}{\cos x}=1 \Rightarrow \cos 3x\cos x-\sin 3x\sin x=0$ روش اول

$\Rightarrow \cos 4x=0 \Rightarrow 4x=k\pi+\frac{\pi}{2} \Rightarrow x=\frac{k\pi}{4}+\frac{\pi}{8}$

روش دوم

$\tan 3x=\frac{1}{\tan x}=\cot x=\tan(\frac{\pi}{2}-x) \Rightarrow 3x=k\pi+\frac{\pi}{2}-x$ ۱۰

$\Rightarrow 4x=k\pi+\frac{\pi}{2}$ ... $x=\frac{k\pi}{4}+\frac{\pi}{8} \Rightarrow$

k	2	3	4	5
x	$\frac{9\pi}{8}$	$\frac{11\pi}{8}$	$\frac{13\pi}{8}$	$\frac{15\pi}{8}$

$\Rightarrow$ مجموع $=\frac{9\pi+11\pi+13\pi+15\pi}{8}=\frac{48\pi}{8}=\boxed{6\pi}$