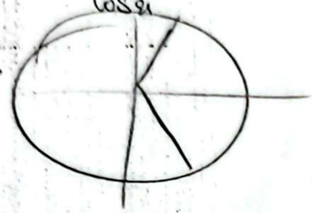
۲۰ آفرین

نام و نام خانوادگی: مهدی الهی پور .... پاسخنامه تشریحی تکلیف شماره ...۱۷... کلاس دوازدهم ب

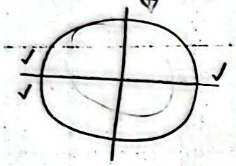
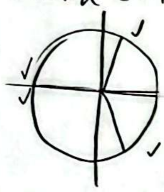
$8\cos x = \frac{1}{\cos^2 x} \rightsquigarrow \cos x \neq 0 \to 8\cos^3 x = 1 \to 2\cos x = 1 \to \cos x = \frac{1}{2}$ ۱

$\to$  $\to$ ۲جواب

۲

این عبارت تعداد صورتی جواب دارد که $\sin^2 x = 0$ و $2\cos(3x) = -2$ باشند ۲

$\to \sin^2 x = 0$ $\cos 3x = -1$

  $\rightsquigarrow$ ۲جواب $\leftarrow$ انتهای π و $-\pi$ مشترک هست

۲

$\sin x\left(2\cos(2x)+1\right) = 0 \to \sin x\left(4\cos^2 x - 1\right) = \sin x\left(3 - 4\sin^2 x\right) = 1$ ۳

$4 - 4\sin^2 x$

$4\cos^2 x = 2\cos 2x + 2$

$\to 3t - 4t^3 = 1 \rightsquigarrow 4t^3 - 3t + 1 = 0 \to (t+1)(4t^2 - 4t + 1) = (t+1)(2t-1)^2 \to \sin x = -1,\ \sin x = \frac{1}{2} \to \frac{3\pi}{2} + \frac{\pi}{6} + \frac{5\pi}{6} = \frac{5\pi}{2}$

۲

$\frac{1}{\sin(\frac{\pi}{2}+2x)} + \frac{1}{\cos(\frac{\pi}{2}+4x)} = 0 \to \frac{1}{\cos 2x} - \frac{1}{\sin 4x} = 0 = \frac{1}{\cos 2x} - \frac{1}{2\sin 2x\cos 2x} = 0$ ۴

$\frac{2\sin 2x - 1}{\sin 4x} = 0 \rightsquigarrow 2\sin 2x = 1 \to \sin 2x = \frac{1}{2}$ ، $\cos 2x \neq 0 \to x = \left\{\frac{\pi}{12}, \frac{5\pi}{12}\right\}$

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

۲

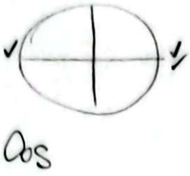
$\cos(x+\frac{\pi}{4}) = \cos x\cos\frac{\pi}{4} - \sin x\sin\frac{\pi}{4} = \frac{\sqrt{2}}{2}(\cos x - \sin x) = \frac{\sqrt{3}}{3} \to \cos - \sin = \frac{\sqrt{2}}{\sqrt{3}}$ ۵

$\frac{m\cancel{\sqrt{6}}}{3} - 3\cancel{\sqrt{6}}\sin 2x = \cancel{\sqrt{6}} \to \frac{m}{3} - 3\sin 2x = 1$ و $(\cos x - \sin x)^2 = 1 - \sin 2x = \frac{2}{3}$

$\to \sin 2x = \frac{1}{3} \rightsquigarrow \frac{m}{3} - 1 = 1 \to m = 6$

۲

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

$\to \cos(x-\frac{\pi}{2})=\pm 1 \to$  $\to x=\{0+\frac{\pi}{2}, \pi+\frac{\pi}{2}, \cancel{2\pi+\frac{\pi}{2}}\} \Rightarrow$ ۲ جواب ۶

$\frac{1}{2}\sin x+\frac{\sqrt{3}}{2}\cos x=\frac{\sqrt{2}}{2} \to \sin 30^\circ \sin x+\cos 30^\circ \cos x=\frac{\sqrt{2}}{2}=\cos(x-30^\circ)$

$\to x-\underbrace{30^\circ}_{\frac{\pi}{6}}=2k\pi\pm\frac{\pi}{4}$

$x=2k\pi+\frac{\pi}{4}+\frac{\pi}{6}=2k\pi+\frac{5\pi}{12} \to \cancel{-2\pi+\frac{5\pi}{12}}, 0+\frac{5\pi}{12}, \cancel{2\pi+\frac{5\pi}{12}}$

$x=2k\pi-\frac{\pi}{4}+\frac{\pi}{6}=2k\pi-\frac{\pi}{12} \to \cancel{-2\pi-\frac{\pi}{12}}, -\frac{\pi}{12}, 2\pi-\frac{\pi}{12}$ ۷

$\frac{5\pi}{12}+2\pi-\frac{\pi}{12}=2\pi+\frac{4\pi}{12}$

$-4\sin x\cos x=1 \to -2\sin 2x=1 \to \sin 2x=-\frac{1}{2}$

$2x=2k\pi-\frac{\pi}{6} \to x=k\pi-\frac{\pi}{12} \to \cancel{-\frac{\pi}{12}}, \frac{11\pi}{12}, \frac{23\pi}{12} = \frac{60\pi}{12}=5\pi$ ۸

$2x=2k\pi-\frac{5\pi}{6} \to x=k\pi-\frac{5\pi}{12} \to \cancel{-\frac{5\pi}{12}}, \frac{7\pi}{12}, \frac{19\pi}{12}$

$(1-\cos 2x)(1+\cos 2x)=1-\cos^2 2x=1-\frac{\cos 4x+1}{2}=\frac{1-\cos 4x}{2}$

$\to A\times\frac{(1-\cos 2x)}{(1-\cos 2x)}=\frac{1}{8}\ \frac{(1-\cos 16x)}{(1-\cos 2x)}=\frac{1}{8} \to \cos 16x=\cos 2x$

$16x=2k\pi+2x \to x=\frac{k\pi}{7}$

$16x=2k\pi-2x \to x=\frac{k\pi}{9}$

$, \cos 2x\neq 0 \to A=\frac{8\pi}{9}$ ۹

$\tan 3x=\tan(\frac{\pi}{2}-x) \xrightarrow{\tan} a=k\pi+b \to 3x=k\pi+\frac{\pi}{2}-x \to 4x=k\pi+\frac{\pi}{2} \to x=\frac{k\pi}{4}+\frac{\pi}{8}$

$\to \frac{9\pi}{8}+\frac{11\pi}{8}+\frac{13\pi}{8}+\frac{15\pi}{8}=\frac{48\pi}{8}=6\pi$ ۱۰