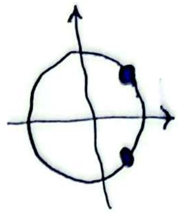
نام و نام خانوادگی ...آرش سلطانی... پاسخنامه تشریحی تکلیف شماره ...۱۷... کلاس ...دوازدهم پسر A...

$\to 8\cos x = 1+\tan^2 x = \frac{1}{\cos^2 x} \xrightarrow{\cos x\neq 0} \cos^3 x = \frac{1}{8}$

۱ $\to \cos x = \frac{1}{2} \to x = 2k\pi \pm \frac{\pi}{3} \xrightarrow{[0,2\pi]} \frac{\pi}{3}, \frac{5\pi}{3}$



در بازه $[0,2\pi]$ ۲ جواب دارد

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۲ با توجه به $5\sin^2 x+2\cos 3x=-2$ ، $\sin x$ و $\cos 3x$ کمترین مقداری که می‌توانند داشته باشند به ترتیب صفر و ۱- است پس:

$\sin x = 0 \xrightarrow{[-\pi,\pi]} x = -\pi, \pi$

$\cos 3x = -1 \to 3x = 2k\pi+\pi \to x = \frac{2k\pi}{3}+\frac{\pi}{3} \xrightarrow{[-\pi,\pi]} -\pi, -\frac{\pi}{3}, \frac{\pi}{3}, \pi$

معادله ۴ جواب دارد

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

$\to 2\sin x\left(2\cos\frac{2x+\frac{\pi}{3}}{2}\cos\frac{2x-\frac{\pi}{3}}{2}\right)=1 \to \sin x\left(\cos\frac{6x+\pi}{6}\cos\frac{6x-\pi}{6}\right)=\frac{1}{4}$

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

$[0,\pi]$:

$\frac{\pi}{2}+2x=4x \to x=\frac{\pi}{4}$

$\frac{\pi}{2}+2x+4x=\pi \to x=\frac{\pi}{6}$

اختلاف $= \alpha = \frac{\pi}{12} \to \tan 2\alpha = \tan\frac{\pi}{6} = \frac{\sqrt{3}}{3}$

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۵ $\to \cos x-\sin x = \sqrt{2}\cos(x+\frac{\pi}{4}) = \frac{\sqrt{2}}{\sqrt{3}} = \frac{\sqrt{6}}{3} \to m\frac{\sqrt{6}}{3} - 3\sqrt{6}\sin 2x = \sqrt{6}$

$\cos x-\sin x = \sqrt{\frac{2}{3}} \xrightarrow{\text{توان ۲}} 1-\sin 2x = \frac{2}{3}$

$\sin 2x = \frac{1}{3}$

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

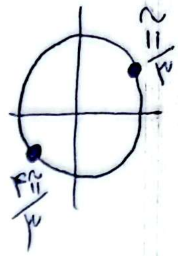
$m = 3+9\sin 2x \to m = 3+9(\frac{1}{3}) = 6$

$\sin(x+\frac{\pi}{6})\cos(x-\frac{\pi}{3}) = \sin(x+\frac{\pi}{6})\cos(\frac{\pi}{3}-x) = \cos^2(\frac{\pi}{3}-x) = 1$ متمم

$\to \cos(x-\frac{\pi}{3}) = \pm 1 \longrightarrow x-\frac{\pi}{3} = 2k\pi \to x = 2k\pi + \frac{\pi}{3}$ 6

$x-\frac{\pi}{3} = 2k\pi + \pi \Rightarrow x = 2k\pi + \frac{4\pi}{3}$

در بازه $[0,2\pi]$ دو جواب $\frac{\pi}{3}$ و $\frac{4\pi}{3}$ دارد



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

$\to x+\frac{\pi}{3} = 2k\pi + \frac{\pi}{4} \to x = 2k\pi + \frac{\pi}{4} - \frac{\pi}{3} = 2k\pi - \frac{\pi}{12} \xrightarrow{[-\pi,2\pi]} -\frac{\pi}{12}, \frac{11\pi}{12}$ 7

$x+\frac{\pi}{3} = 2k\pi + \frac{3\pi}{4} \to x = 2k\pi + \frac{3\pi}{4} - \frac{\pi}{3} = 2k\pi + \frac{5\pi}{12} \xrightarrow{[-\pi,2\pi]} \frac{5\pi}{12}, \frac{17\pi}{12}$

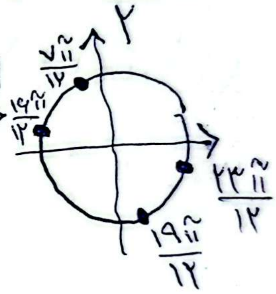
مجموع $= \frac{32\pi}{12} = \frac{8\pi}{3}$

$\to -4\sin x\cos x = -2\sin 2x = 1 \longrightarrow \sin 2x = -\frac{1}{2} = \sin(\frac{7\pi}{6})$

$2x = 2k\pi + \frac{7\pi}{6} \to x = k\pi + \frac{7\pi}{12}$

$2x = 2k\pi + \pi - \frac{7\pi}{6} = 2k\pi - \frac{\pi}{6} \to x = k\pi - \frac{\pi}{12}$ 8

$[0,2\pi]$



$S = \frac{7\pi + 16\pi + 19\pi + 23\pi}{12} = \frac{65\pi}{12}$

$\times \frac{1-\cos 2\alpha}{1-\cos 2\alpha} \longrightarrow \underbrace{\sin^2 2\alpha}_{\frac{1-\cos 4\alpha}{2}} \frac{(1+\cos 4\alpha)(1+\cos 8\alpha)}{1-\cos 2\alpha} = \underbrace{\sin^2 4\alpha}_{\frac{1-\cos 8\alpha}{2}} \frac{1+8\cos\alpha}{2(1-\cos 2\alpha)} = \frac{\sin^2 8\alpha}{4(1-\cos 2\alpha)} = \frac{1}{8}$

$\to \sin^2 8\alpha = \frac{1-\cos 2\alpha}{2} = \sin^2\alpha \to \sin 8\alpha = \pm\sin\alpha$ 9

$\sin 8\alpha = \sin\alpha$: $\to 8\alpha = 2k\pi + \alpha$, $\to 8\alpha = 2k\pi + \pi - \alpha$

$\sin 8\alpha = \sin(-\alpha)$: $\to 8\alpha = 2k\pi - \alpha$, $\to 8\alpha = 2k\pi + \pi + \alpha$

$\to \alpha = \frac{2k\pi}{7}$
$\to \alpha = \frac{2k\pi}{7} + \frac{\pi}{7}$
$\to \alpha = \frac{2k\pi}{9}$
$\to \alpha = \frac{2k\pi}{9} + \frac{\pi}{9}$

اولین مجموعه A $\xrightarrow[Max]{\text{عضو}} = \pi$

$\to \tan 3x = \frac{1}{\tan x} = \cot x \to \frac{\sin 3x}{\cos 3x} = \frac{\cos x}{\sin x} \to \cos 3x\cos x = \sin 3x\sin x$

$\to \cos 3x\cos x - \sin 3x\sin x = \cos 4x = 0 = \cos\frac{\pi}{2} \to 4x = 2k\pi \pm \frac{\pi}{2}$ 10

$6\pi = \frac{48\pi}{8} = \frac{9\pi}{8} + \frac{11\pi}{8} + \frac{13\pi}{8} + \frac{15\pi}{8} \xleftarrow{[\pi,2\pi]} x = \frac{k\pi}{2} \pm \frac{\pi}{8}$