تکلیف سری ۱۰، ۱۴۰۱ — به نام خدا — مهلا ستاری - دوازدهم تجربی B

۱-

$T=\frac{\pi}{|-2|} \to \tan\frac{\pi}{4}=1 \qquad \frac{\frac{\pi}{2}+1}{2}=\frac{\pi}{4}$

۲-

$x^2-\sin x-\frac{1}{4}\cos^2 x=0 \to x=\frac{2}{3} \to \frac{4}{9}-\frac{2}{3}\sin\alpha-\frac{1}{4}(1-\sin^2\alpha)=0$

$\frac{1}{4}\sin^2\alpha-\frac{2}{3}\sin\alpha+\frac{7}{36}=0 \to 9\sin^2\alpha-24\sin\alpha+7=0 \to \sin\alpha=\frac{24\pm\sqrt{324}}{18} \begin{cases}\frac{7}{3} \ \times \\ \frac{1}{3}\end{cases}$

$\frac{8}{9} \Rightarrow \frac{1}{\cos^2\alpha}=1+\tan^2\alpha \to \frac{9}{8}=\frac{1}{\frac{8}{9}}$

۳-

$y^{\sin\alpha} - y^{-\cos\alpha} = y^{3} \to \frac{\sin\alpha}{-\cos\alpha}=3 \to \sin\alpha=-3\cos\alpha$

$\sin^2\alpha+\cos^2\alpha=1 \to 10\cos^2\alpha=1 \to \cos\alpha=\frac{1}{10} \begin{cases}+\frac{1}{\sqrt{10}} \\ -\frac{1}{\sqrt{10}} \ \times \ \ y^{\alpha} \to \alpha>0\end{cases}$

$\sin\alpha-\cos\alpha=\frac{3}{\sqrt{10}}+\frac{1}{\sqrt{10}}=\frac{4}{\sqrt{10}}$

۴-

$\sin^4\alpha+\cos^2\alpha=\frac{4}{5} \to (1-\cos^2\alpha)^2+\cos^2\alpha=\frac{4}{5} \to 1-2\cos^2\alpha+\cos^4\alpha+\cos^2\alpha=\frac{4}{5}$

$\frac{1-\cos^2\alpha}{\sin^2\alpha}+\cos^2\alpha=\frac{4}{5} \to \sin^2\alpha+\cos^4\alpha=\frac{4}{5}$

۵-

$\frac{\sin^2\alpha}{\cos\alpha}-\frac{1}{\cos\alpha}>0 \to \frac{\overbrace{\sin^2\alpha-1}^{<0}}{\cos\alpha}>0 \to \cos\alpha<0$

$\frac{\sin(3+\cos\alpha)}{2-2\cos^2\alpha}<0 \to \frac{\sin\alpha(\overbrace{3+\cos\alpha}^{>0})}{\underbrace{2\sin^2\alpha}_{>0}}<0 \to \sin\alpha<0$

ناحیه ۳

$(2(1-\cos^2\alpha))$

$2\sin^2\alpha$

پاسخ سوالات سازی

۶- $\frac{2}{\sin\alpha} + \frac{3}{\cos\alpha} = 0 \rightarrow \frac{2\cos\alpha + 3\sin\alpha}{\sin\cos\alpha} = 0 \rightarrow 2\cos\alpha + 3\sin\alpha = 0 \rightarrow \cos\alpha = -\frac{3\sin\alpha}{2}$

$\tan\alpha + \cot\alpha = \frac{\sin\alpha}{\cos\alpha} + \frac{\cos\alpha}{\sin\alpha} = \frac{\cos^2\alpha + \sin^2\alpha}{\sin\cos\alpha} = \frac{\sin\alpha}{-\frac{3}{2}\sin\alpha} + \frac{-\frac{3}{2}\sin\alpha}{\sin\alpha} = -\frac{2}{3} - \frac{3}{2} = -\frac{13}{6}$

۷- $\sqrt{1+\sin 50} \rightarrow 1 + \sin 50 = \sin 90 + \sin 50 = 2\sin(70)\times\cos(20) = 2\cos^2(20)\times\cos^2(20)$

$\sin 50 + \sin 10 \quad = 2\cos^2 20$

$\sin 50 + \sin 10 = 2\underset{1}{\cancel{\sin 30}} \cos 20 = \cos 20 \rightarrow \frac{\sqrt{2}\cos 20}{\cos 20} = \sqrt{2}$

۸- $1 - 2\sin^2 5 = 1 - \sin^2 5 - \sin^2 5 \rightarrow \cos^2 5 - \sin^2 5 = \cos 10 \,/\, 2\cos^2 10 - 1 = -\sin^2 10 + \cos^2 10 = \cos 20$

$\frac{1-\tan^2 20}{1+\tan^2 20} = \cos 40 \qquad \cos 10 \cdot \cos 20 \cdot \cos 40 + \frac{\sin 10}{\sin 10} \rightarrow \frac{1}{8}\,\frac{\overset{\cos 10}{\sin 80}}{\sin 10} = \frac{1}{8}\cos 10$

۹- $\sin\alpha + 3\cos\alpha = 2 \rightarrow \sin\alpha = 2 - 3\cos\alpha \quad 1 = \sin^2\alpha + \cos^2\alpha = (2-3\cos\alpha)^2 + \cos^2\alpha = 1$

$10\cos^2\alpha - 12\cos\alpha = -3 \xrightarrow[\cos^2\alpha = \frac{1+\cos 2\alpha}{2}]{} \cos 2\alpha = 2\cos^2\alpha - 1 \rightarrow 5\cos 2\alpha = 10\cos^2\alpha - 5 = 10\cos^2\alpha - 12\cos\alpha$

$= -8$ $\qquad -5$

۱۰- $\sin\alpha \cdot \sin\beta = \frac{1}{2}(\cos(\alpha-\beta) - \cos(\alpha+\beta)) \rightarrow \sin\beta \cdot \sin C = \frac{1}{2}(\cos(\beta - C) - \cos(\beta + C))$

$\cos\alpha \cdot \cos\beta = \frac{1}{2}(\cos(\alpha+\beta)) + \cos(\alpha-\beta) \cdot + \cos\frac{a}{2} \times \cos\frac{a}{2} = \frac{1}{2}(\cos A + \overset{1}{\cancel{\cos 0}})\,, A + B + C = 180$

$B = 180 - (A + C)\,, B + C = 180 - A \rightarrow \frac{1}{2}\cos(180 - (2C + A)) - \cos(180 - A)) = \frac{1}{2}(\cos 2C + A + \cos A)$

$\frac{1}{2}\cos A + \frac{1}{2} = -\frac{1}{2}\cos 2C + A + \frac{1}{2}\cos A \rightarrow \cos 2C + A = -1 \rightarrow 2C + A = 180 \rightarrow C + B = 72$

$\rightarrow A = 180 - (2 \times 72) = 36$