نام و نام خانوادگی ......[illegible]...... پاسخنامه تشریحی تکلیف شماره ..۱۰.. کلاس ....دوازدهم تجربی A....

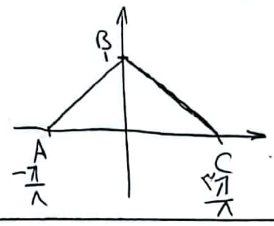
۱

$y=\tan\left(-2x+\frac{\pi}{4}\right) \longrightarrow B \Rightarrow x=0 \Rightarrow \tan\left(\frac{\pi}{4}\right)=1 \Rightarrow B(0,1)$

$\longrightarrow A, C \Rightarrow \tan\left(-2x+\frac{\pi}{4}\right)$ ت.ن $\longrightarrow \tan\left(-2x+\frac{\pi}{4}\right)=\tan\left(\frac{\pi}{2}\right) \Rightarrow -2x=\frac{\pi}{2}-\frac{\pi}{4}$, $x=-\frac{\pi}{8}$ A

$\longrightarrow \tan\left(-2x+\frac{\pi}{4}\right)=\tan\left(-\frac{\pi}{2}\right) \Rightarrow -2x=-\frac{\pi}{2}-\frac{\pi}{4} \Rightarrow x=\frac{3\pi}{8}$ C

$C-A=T=\frac{\pi}{|-2|}=\frac{\pi}{2}$



$\Rightarrow \frac{1\times\left(\frac{3\pi}{8}-\left(-\frac{\pi}{8}\right)\right)}{2}=\boxed{\frac{\pi}{4}}$

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

$\times 36: \; 16-24\sin\alpha-9(1-\sin^2\alpha)=9\sin^2\alpha-24\sin\alpha+7=0$

$\Rightarrow \sin\alpha=\frac{24\pm\overset{18}{\sqrt{576-252}}}{18} \Rightarrow \frac{42}{18}$ غ.ق.ق

$\Rightarrow \frac{6}{18}=\frac{1}{3}\ \checkmark \Rightarrow \cos\alpha=\sqrt{1-\sin^2\alpha}=\sqrt{1-\frac{1}{9}}=\frac{\sqrt{8}}{3}$

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

۳

$\log(\underset{\sin\alpha>0}{\sin\alpha})-\log(\underset{\cos\alpha<0}{-\cos\alpha})=\log 3 \Rightarrow \log\frac{\sin\alpha}{-\cos\alpha}=\log 3 \Rightarrow \sin\alpha=-3\cos\alpha$

$\sin^2\alpha+\cos^2\alpha=1 \Rightarrow 9\cos^2\alpha+\cos^2\alpha=1 \Rightarrow \cos^2\alpha=\frac{1}{10} \Rightarrow \cos\alpha=-\frac{\sqrt{10}}{10}, \; \sin\alpha=\frac{3\sqrt{10}}{10}$

$\Rightarrow \sin\alpha-\cos\alpha=\frac{3\sqrt{10}}{10}-\left(\frac{-\sqrt{10}}{10}\right)=\frac{4\sqrt{10}}{10}=\boxed{\frac{2\sqrt{10}}{5}}$

۴

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

$\sin^2\theta\cos^2\theta=\frac{1}{5}$

$\cos^4\theta+\sin^2\theta=\cos^4\theta+1-\cos^2\theta=\cos^2\theta(\cos^2\theta-1)+1=-\sin^2\theta\cos^2\theta+1 \Rightarrow -\frac{1}{5}+1=\boxed{\frac{4}{5}}$

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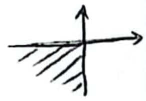
$\frac{3\sin x+\sin x\cos x}{2-2\cos^2 x}<0 \Rightarrow \frac{\sin x(3+\cos x)}{2\underbrace{(1-\cos^2 x)}_{\sin^2 x}}=\frac{\overset{+\text{همواره}}{3+\cos x}}{2\sin x}<0$, $\sin x\neq 0$ $\Rightarrow 2\sin x<0$, $\sin x<0$ $\longrightarrow$ (ربع سوم

$\sin x\tan x-\frac{1}{\cos x}>0 \Rightarrow \frac{1}{\cos x}\underbrace{(\sin^2 x-1)}_{-\cos^2 x}>0 \underset{\cos x\neq 0}{\Longrightarrow} -\cos x>0 \Rightarrow \cos x<0$



$\frac{2}{\sin x} + \frac{3}{\cos x} = 0 \Rightarrow \frac{2\cos x + 3\sin x}{\sin x \cos x} = 0 \Rightarrow 2\cos x + 3\sin x = 0 \Rightarrow \cos x = -\frac{3}{2}\sin x$ $\sin^2 x + \cos^2 x = 1 \Rightarrow \sin^2 x + \frac{9}{4}\sin^2 x = 1 \Rightarrow \sin^2 x = \frac{4}{13} \Rightarrow \sin x = \pm\frac{2\sqrt{13}}{13}$ $\cos x = \mp\frac{3\sqrt{13}}{13} \xrightarrow[\text{علامت}]{\text{مختلف}} \sin x \cos x < 0$ $\tan x + \cot x = \frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = \frac{\sin^2 x + \cos^2 x}{\sin x \cos x} = \frac{1}{\sin x \cos x} = \frac{1}{-\frac{2\sqrt{13}}{13} \times \frac{3\sqrt{13}}{13}} = \boxed{-\frac{13}{6}}$	۶
$1 + \sin 50 = 1 + 2\sin 25 \cos 25 = (\sin 25 + \cos 25)^2 \Rightarrow \sqrt{1+\sin 50} = \sin 25 + \cos 25$ $\sin\alpha + \cos\alpha = \sqrt{2}\sin(\alpha + \frac{\pi}{4}) \Rightarrow \sin 25 + \cos 25 = \sqrt{2}\sin 70 = \sqrt{2}\cos 20$ (متمم) $\sin 50 + \sin 10 = \sin(20+30) + \sin(30-20) = \cancel{\sin 20 \cos 30} + \sin 30 \cos 20 + \sin 30 \cos 20 - \cancel{\cos 30 \sin 20}$ $= 2\overset{\frac{1}{2}}{\cancel{\sin 30}} \cdot \cos 20 = \cos 20$ (مفروض) $\Rightarrow \frac{\sqrt{1+\sin 50}}{\sin 50 + \sin 10} = \frac{\sqrt{2}\cos 20}{\cos 20} = \boxed{\sqrt{2}}$	۷
$\sin^2\alpha = \frac{1-\cos 2\alpha}{2} \Rightarrow \cos 2\alpha = 1 - 2\sin^2\alpha \Rightarrow 1 - 2\sin^2 5 = \cos 10$ $\cos^2\alpha = \frac{1+\cos 2\alpha}{2} \Rightarrow \cos 2\alpha = 2\cos^2\alpha - 1 \Rightarrow 2\cos^2 10 - 1 = \cos 20$ $\cos 2\alpha = \frac{1-\tan^2\alpha}{1+\tan^2\alpha} \Rightarrow \frac{1-\tan^2 20}{1+\tan^2 20} = \cos 40$ $\quad \frac{1}{2}\sin 20 \quad \frac{1}{4}\sin 40 \quad \frac{1}{8}\sin 80$ $\Rightarrow (1-2\sin^2 5)(2\cos^2 10 - 1)\left(\frac{1-\tan^2 20}{1+\tan^2 20}\right) = \frac{\sin 10}{\sin 10} \times \cos 10 \times \cos 20 \times \cos 40 = \frac{1}{8}\frac{\sin 80}{\sin 10}$ $\Rightarrow \frac{1}{8}\frac{\sin(\frac{\pi}{2} - 10)}{\sin 10} = \frac{1}{8}\frac{\cos 10}{\sin 10} = \boxed{\frac{1}{8}\cot 10}$	۸
$\cos 2\alpha = 2\cos^2\alpha - 1 \Rightarrow 5\cos 2\alpha - 12\cos\alpha = 10\cos^2\alpha - 12\cos\alpha - 5 = ?$ $\sin\alpha + 3\cos\alpha = 2 \Rightarrow \sin\alpha = 2 - 3\cos\alpha \Rightarrow \sin^2\alpha + \cos^2\alpha = 1$ $(2 - 3\cos\alpha)^2 + \cos^2\alpha = 9\cos^2\alpha + 4 - 12\cos\alpha + \cos^2\alpha = 10\cos^2\alpha - 12\cos\alpha + 4 = 1$ $10\cos^2\alpha - 12\cos\alpha = -3$ $\Rightarrow 10\cos^2\alpha - 12\cos\alpha - 5 = -3 - 5 = \boxed{-8}$	۹
$\cos^2\frac{A}{2} = \frac{1+\cos A}{2}$ $\cos A = \cos(\pi - (B+C)) = -\cos(B+C)$ $\Rightarrow 1 - \cos(B+C) = 2\sin B \sin C$ $1 - (\cos B \cos C - \sin B \sin C) = 2\sin B \sin C$ $1 - \cos B \cos C + \sin B \sin C = 2\sin B \sin C$ $1 - (\cos B \cos C + \sin B \sin C) = 0 \Rightarrow 1 - \cos(B-C) = 0 \Rightarrow \cos(B-C) = 1 \Rightarrow B - C = 0 \Rightarrow B = C = 72$ $\hat{A} = 180 - (\hat{B} + \hat{C}) = 180 - 144$ $\boxed{\hat{A} = 36^\circ}$	۱۰