نام و نام خانوادگی ....[illegible]....... پاسخنامه تشریحی تکلیف شماره ..۱۵.. کلاس ....دوازدهم تجربی A.......

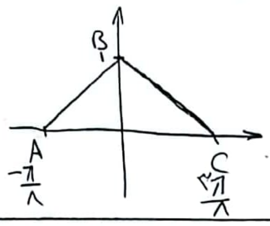
۲۰

۱

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

$\longrightarrow A, C \Rightarrow \tan(-2x+\frac{\pi}{4})=0 \longrightarrow \tan(-2x+\frac{\pi}{4})=\tan(\frac{\pi}{2}) \Rightarrow -2x=\frac{\pi}{2}-\frac{\pi}{4} \quad x=-\frac{\pi}{8}$ A

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



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

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

(۲) ✓

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

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

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

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

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

(۲) ✓

۳

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

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

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

(۲) ✓

۴

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

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

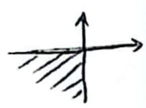
$\cos^4\theta+\sin^2\theta=\cos^4\theta+1-\cos^2\theta=\cos^2\theta(\cos^2\theta-1)+1=-\sin^2\theta\cos^2\theta+1 \Rightarrow -\frac{1}{5}+1=\boxed{\frac{4}{5}}$

(۲) ✓

۵

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

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



(۲) ✓

$$\frac{2}{\sin x}+\frac{3}{\cos x}=0 \Rightarrow \frac{2\cos x+3\sin x}{\sin x\cos x}=0 \Rightarrow 2\cos x+3\sin x=0 \Rightarrow \cos x=\frac{-3}{2}\sin x$$

$$\sin^2 x+\cos^2 x=1 \Rightarrow \sin^2 x+\frac{9}{4}\sin^2 x=1 \Rightarrow \sin^2 x=\frac{4}{13} \Rightarrow \sin x=\pm\frac{2\sqrt{13}}{13}$$

$$\cos x=\mp\frac{3\sqrt{13}}{13} \xrightarrow[\text{العلامه}]{\text{مختلف}} \sin x\cos x<0$$ ۶

$$\tan x+\cot x=\frac{\sin x}{\cos x}+\frac{\cos x}{\sin x}=\frac{\sin^2 x+\cos^2 x}{\sin x\cos x}=\frac{1}{\sin x\cos x}=\frac{1}{\frac{-2\sqrt{13}}{13}\times\frac{3\sqrt{13}}{13}}=\boxed{\frac{-13}{6}}$$

۲ ✓

$$1+\sin 50=1+2\sin 25\cos 25=(\sin 25+\cos 25)^2 \Rightarrow \sqrt{1+\sin 50}=\sin 25+\cos 25$$

$$\sin\alpha+\cos\alpha=\sqrt{2}\sin(\alpha+\frac{\pi}{4}) \Rightarrow \sin 25+\cos 25=\sqrt{2}\sin 70=\sqrt{2}\cos 20$$ (متمم)

$$\sin 50+\sin 10=\sin(20+30)+\sin(30-20)=\cancel{\sin 20\cos 30}+\sin 30\cos 20+\sin 30\cos 20-\cancel{\cos 30\sin 20}$$ ۷

$$=2\,\overset{\frac{1}{2}}{\cancel{\sin 30}}\cos 20=\cos 20$$ (مفروض)

$$\Rightarrow\frac{\sqrt{1+\sin 50}}{\sin 50+\sin 10}=\frac{\sqrt{2}\cos 20}{\cos 20}=\boxed{\sqrt{2}}$$

۲ ✓

$$\sin^2\alpha=\frac{1-\cos 2\alpha}{2} \Rightarrow \cos 2\alpha=1-2\sin^2\alpha \Rightarrow 1-2\sin^2 5=\cos 10$$

$$\cos^2\alpha=\frac{1+\cos 2\alpha}{2} \Rightarrow \cos 2\alpha=2\cos^2\alpha-1 \Rightarrow 2\cos^2 10-1=\cos 20$$

$$\cos 2\alpha=\frac{1-\tan^2\alpha}{1+\tan^2\alpha} \Rightarrow \frac{1-\tan^2 20}{1+\tan^2 20}=\cos 40 \qquad \frac{1}{2}\sin 20 \quad \frac{1}{4}\sin 40 \quad \frac{1}{8}\sin 80$$

$$\Rightarrow(1-2\sin^2 5)(2\cos^2 10-1)\left(\frac{1-\tan^2 20}{1+\tan^2 20}\right)=\frac{\sin 10}{\sin 10}\times\cos 10\times\cos 20\times\cos 40=\frac{1}{8}\frac{\sin 80}{\sin 10}$$ ۸

$$\Rightarrow\frac{1}{8}\frac{\sin(\frac{\pi}{2}-10)}{\sin 10}=\frac{1}{8}\frac{\cos 10}{\sin 10}=\boxed{\frac{1}{8}\cot 10}$$

۲ ✓

$$\cos 2\alpha=2\cos^2\alpha-1 \Rightarrow 5\cos 2\alpha-12\cos\alpha=10\cos^2\alpha-12\cos\alpha-5=?$$

$$\sin\alpha+3\cos\alpha=2 \Rightarrow \sin\alpha=2-3\cos\alpha \Rightarrow \sin^2\alpha+\cos^2\alpha=1$$

$$(2-3\cos\alpha)^2+\cos^2\alpha=9\cos^2\alpha+4-12\cos\alpha+\cos^2\alpha=10\cos^2\alpha-12\cos\alpha+4=1$$ ۹

$$10\cos^2\alpha-12\cos\alpha=-3$$

$$\Rightarrow 10\cos^2\alpha-12\cos\alpha-5=-3-5=\boxed{-8}$$

۲ ✓

$$\cos^2\frac{A}{2}=\frac{1+\cos A}{2}$$

$$\cos A=\cos(\pi-(B+C))=-\cos(B+C)$$

$$\Rightarrow 1-\cos(B+C)=2\sin B\sin C$$

۲ ✓ ۱۰

$$1-(\cos B\cos C-\sin B\sin C)=2\sin B\sin C \qquad \hat{A}=180-(\hat{B}+\hat{C})=180-144$$

$$1-\cos B\cos C+\sin B\sin C=2\sin B\sin C \qquad \boxed{\hat{A}=36^\circ}$$

$$1-(\cos B\cos C+\sin B\sin C)=0 \Rightarrow 1-\cos(B-C)=0 \Rightarrow \cos(B-C)=1 \Rightarrow B-C=0 \Rightarrow B=C$$