نام و نام خانوادگی ......صبا امینی...... پاسخنامه تشریحی تکلیف شماره ......۱۵ کلاس ......دوازدهم ریاضی......

۲۰

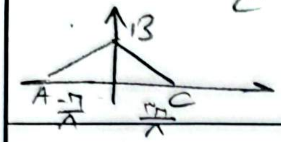
۱

$y=\tan(-۲x+\frac{\pi}{۴}) \to B \Rightarrow x=۰ \to \tan(\frac{\pi}{۴})=۱ \to B=(۰,۱)$

$\to A , C \to \tan(-۲x+\frac{\pi}{۴}) \Rightarrow$ ت.ن

$\tan(-۲x+\frac{\pi}{۴})=\tan(\frac{\pi}{۲}) \to -۲x=\frac{\pi}{۲}-\frac{\pi}{۴} \to x=\frac{-\pi}{۸}$ / $\tan=(-۲x+\frac{\pi}{۴})=\tan(-\frac{\pi}{۲})$

$\to -۲x=-\frac{\pi}{۲}-\frac{\pi}{۴} \to x=\frac{۳\pi}{۸}\ C$



$\frac{۱\times(\frac{۳\pi}{۸}-(-\frac{\pi}{۸}))}{۲}=\frac{\pi}{۴}$ ۲ ✓ $C-A=T \to \frac{\pi}{۲}$

۲

$x^۲-(\sin\alpha)x-\frac{۱}{۴}\cos^۲\alpha=۰ \xrightarrow[x=\frac{۲}{۳}]{} \frac{۴}{۹}-\frac{۲}{۳}\sin\alpha-\frac{۱}{۴}(۱-\sin^۲\alpha)=۰$

$\xrightarrow{\times ۳۶} ۱۶-۲۴\sin\alpha-۹(۱-\sin^۲\alpha)=۰$

$\sin\alpha=\frac{۲۴\pm\sqrt{۵۷۶-۲۵۲}}{۱۸}$ → $\frac{۴۲}{۱۸}$ غ ق ق

→ $\frac{۶}{۱۸}=\frac{۱}{۳} \to \cos\alpha=\sqrt{۱-\sin^۲\alpha}=\sqrt{۱-\frac{۱}{۹}}=\frac{\sqrt{۸}}{۳}$

$۱+\tan^۲\alpha=\frac{۱}{\cos^۲\alpha} \to \frac{۱}{\frac{۸}{۹}}=\frac{۹}{۸}$ ۲ ✓

۳

$\log(\sin\alpha)-\log(-\cos\alpha)=\log ۳ \xrightarrow[\cos\alpha<۰]{\sin\alpha>۰} \log\frac{\sin}{-\cos}=\log ۳$

$\sin\alpha=-۳\cos\alpha \to ۹\cos^۲\alpha+\cos^۲\alpha=۱ \to \cos^۲\alpha=\frac{۱}{۱۰} \to \cos\alpha=\frac{-\sqrt{۱۰}}{۱۰}$

$\sin\alpha=\frac{۳\sqrt{۱۰}}{۱۰}$

$\sin\alpha-\cos\alpha=\frac{۳\sqrt{۱۰}}{۱۰}-(\frac{-\sqrt{۱۰}}{۱۰})=\frac{۲\sqrt{۱۰}}{۵}$ ۲ ✓

۴

$\sin^۴\theta+\cos^۲\theta=\frac{۴}{۵} \to \sin^۴\theta+۱-\sin^۲\theta=\sin^۲\theta(\sin^۲\theta-۱)=\frac{-۱}{۵}$

$\sin^۲\theta\cos^۲\theta=\frac{۱}{۵}$

$\cos^۴\theta+\sin^۲\theta=\cos^۴\theta+۱-\cos^۲\theta=\cos^۲\theta(\cos^۲\theta-۱)+۱=-\sin^۲\theta\cos^۲\theta+۱$

$\to -\frac{۱}{۵}+۱=\frac{۴}{۵}$ ۲ ✓

۵

$\frac{۳\sin x+\sin x\cos x}{۲-۲\cos^۲x}<۰ \to \frac{\overset{\sin x\neq ۰}{\sin x}(۳+\cos x)}{۲(\underbrace{۱-\cos^۲x}_{\sin^۲x})}=\frac{\overset{+\ \text{همواره}}{۳+\cos x}}{۲\sin x}<۰$

ناحیه سوم

۲ ✓

$\to \begin{matrix} ۲\sin x<۰ \\ \sin x<۰ \end{matrix}$ $\sin x\tan x-\frac{۱}{\cos x}>۰ \xrightarrow[\cos x\neq ۰]{} \begin{matrix} -\cos x>۰ \\ \cos x<۰ \end{matrix}$

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۶

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

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

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

$$\cos x=\pm\frac{3\sqrt{13}}{13}$$

$$\tan x+\cot x=\frac{\sin x}{\cos x}+\frac{\cos x}{\sin x}=\frac{\sin^2 x+\cos^2 x}{\sin x\cos x}=\frac{1}{\sin x\cos x}=\frac{1}{\frac{-2\sqrt{13}}{13}\times\frac{3\sqrt{13}}{13}}=\frac{-13}{6} \qquad \sin x\cos x<0$$

2

۷

$$\frac{\sqrt{1+\sin 50}}{\sin 50+\sin 10}=?$$

$$1+\sin\alpha \Rightarrow \sin^2 25+2\sin 25\cos 25+\cos^2 25$$

$$\longrightarrow (\sin 25+\cos 25)^2 \xrightarrow{\text{جذر از صورت}} =\sin 25+\cos 25$$

$$\sin\alpha+\cos\alpha=\sqrt{2}\sin\left(\alpha+\frac{\pi}{4}\right) \longrightarrow \sin 25+\cos 25=\sqrt{2}\sin 70=\sqrt{2}\cos 20$$

2

$$\sin 50+\sin 10 \longrightarrow \sin(30+20)+\sin(30-20) \longrightarrow \sin 30\cos 20+\sin 20\cos 30+\sin 30\cos 20-\sin 20\cos 30$$

$$\Rightarrow \cos 20 \qquad \frac{\sqrt{2}\cos 20}{\cos 20}=\sqrt{2}$$

۸

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

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

$$\cos 2\alpha=\frac{1-\tan^2\alpha}{1+\tan^2\alpha} \longrightarrow \frac{1-\tan^2 20}{1+\tan^2 20}=\cos 40$$

2

$$(1-2\sin^2 5)(2\cos^2 10-1)\left(\frac{1-\tan^2 20}{1+\tan^2 20}\right)$$

$$\longrightarrow \frac{\sin 10}{\sin 10}\times\cos 10\times\cos 20\times\cos 40=\frac{1}{8}\,\frac{\sin 80}{\sin 10}$$

$$\longrightarrow \frac{1}{8}\,\frac{\sin\left(\frac{\pi}{2}-10\right)}{\sin 10} \longrightarrow \frac{1}{8}\times\frac{\cos 10}{\sin 10}=\frac{1}{8}\cot 10$$

۹

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

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

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

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

2

$$10\cos^2\alpha-12\cos\alpha-5=-3-5=-8$$

۱۰

$$\cos^2\frac{A}{2}=\frac{1+\cos A}{2} \qquad \cos A=\cos(\pi-(B+C))=-\cos(B+C)$$

$$\longrightarrow 1-\cos(B+C)=2\sin B\sin C \quad / \quad 1-(\cos B\cos C-\sin B\sin C)=2\sin B\sin C$$

$$1-\cos B\cos C+\sin B\sin C=2\sin B\sin C \qquad 1-(\cos B\cos C+\sin B\sin C)=0$$

2

$$1-\cos(B-C)=0 \longrightarrow \cos(B-C)=1 \longrightarrow B-C=0 \to B=C=72^\circ$$

$$\hat{A}=180-144=36^\circ$$

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