۲۰ آفرین

نام و نام خانوادگی ...مهدی رحیمی پور...... پاسخنامه تشریحی تکلیف شماره ۱۵ کلاس دوازدهم تجربی ...

$B \rightarrow x=0 \rightarrow y=\tan\frac{\pi}{4}=1$

$C \rightarrow y=-\infty \rightarrow y=\tan -\frac{\pi}{2} \rightarrow -2x+\frac{\pi}{4}=-\frac{\pi}{2} \rightarrow 2x=\frac{3\pi}{4} \rightarrow x=\frac{3\pi}{8}$

$A \rightarrow y=+\infty \rightarrow y=\tan\frac{\pi}{2} \rightarrow -2x+\frac{\pi}{4}=\frac{\pi}{2} \rightarrow 2x=-\frac{\pi}{4} \rightarrow x=-\frac{\pi}{8}$

$\rightarrow AC=\frac{3\pi}{8}+\frac{\pi}{8}=\frac{\pi}{2}$

$y_D=1$

$\rightarrow S=\frac{\pi}{2}\times 1\times\frac{1}{2}=\frac{\pi}{4}$ ۱

log تعریف شده ← sin و cos<0 است

$\rightarrow \log\frac{\sin\alpha}{-\cos\alpha}=\log 3 \rightarrow \frac{\sin\alpha}{-\cos\alpha}=3 \rightarrow -\tan\alpha=3 \rightarrow \tan\alpha=-3$

(مثلث با اضلاع $\sqrt{10}$، ۳ و ۱)

چون $\sin\alpha>0$ ← ناحیه ۲ و $\frac{\pi}{2}<\alpha<\frac{3\pi}{2}$ ۲

$\rightarrow \sin\alpha-\cos\alpha=\frac{3}{\sqrt{10}}+\frac{1}{\sqrt{10}}=\frac{2\sqrt{10}}{5}$

جابجا

جایگزینی $\rightarrow \frac{4}{9}-\frac{2}{3}\sin\alpha-\frac{1}{4}\cos^2\alpha=\frac{4}{9}-\frac{2}{3}\sin\alpha+\frac{1}{4}\sin^2\alpha-\frac{1}{4}=0$

$\times 36 \rightarrow 16-24t+9t^2-9=0 \rightarrow 9t^2-24t+7=0 \rightarrow t^2-24+63=0 \rightarrow t=\frac{21}{9},\frac{3}{9}$

$\rightarrow \sin\alpha=\frac{1}{3} \rightarrow \cos\alpha=\pm\frac{\sqrt{8}}{3} \rightarrow \cos^2\alpha=\frac{8}{9} \rightarrow \frac{1}{\cos^2\alpha}=\frac{9}{8}$ ۳

$\frac{4}{5}=\sin^4\alpha-\sin^2\alpha+1=\sin^4\alpha-2\sin^2\alpha+1+\sin^2\alpha$ ۴

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

$\frac{\sin\alpha(3+\cos\alpha)}{2\sin^2\alpha}<0 \rightarrow \sin\alpha<0$ ، $\frac{\sin^2\alpha}{\cos\alpha}-\frac{1}{\cos\alpha}>0 \rightarrow \frac{-\cos^2\alpha}{\cos\alpha}=-\cos\alpha>0$ ۵

$\rightarrow \cos<0$ و $\sin<0 \rightarrow$ ربع سوم

$\frac{2\cos\alpha+3\sin\alpha}{\sin\alpha\cos\alpha}=0 \to 2\cos\alpha=-3\sin\alpha \to \tan\alpha=\frac{-2}{3} \to \cot\alpha=\frac{3}{2}$ 4

$\to \tan\alpha+\cot\alpha=\frac{-2}{3}-\frac{3}{2}=\frac{-9-4}{6}=\frac{-13}{6}$

(۲)

$\frac{\sqrt{1+\cos 40^\circ}}{\cos 80^\circ+\cos 40^\circ}=\frac{\sqrt2\cos 20^\circ}{-1+2\cos^2 40^\circ+\cos 40^\circ}=\frac{\sqrt2\cos 20^\circ}{2\cos^2 40^\circ+\cos 40^\circ-1}=$

$\frac{\sqrt2\cos 20^\circ}{(2t-1)(t+1)}=\frac{\sqrt2\cos 20^\circ}{(2\cos 40^\circ-1)(2\cos^2 20^\circ)}=\frac{\sqrt2}{2}\times\frac{1}{(4\cos^2 20^\circ-3)\cos 20^\circ}=\frac{\sqrt2}{2}\times\frac{1}{4\cos^3 20^\circ-3\cos 20^\circ}$ ۷

$=\frac{\sqrt2}{2}\times\frac{1}{\cos 60^\circ}=\sqrt2$

(۲)

$A=\cos 10^\circ\cos 20^\circ\cos 40^\circ \to A=\frac{\sin 10^\circ}{\sin 10^\circ}\cos 10^\circ\cos 20^\circ\cos 40^\circ \to A=\frac{\sin 20^\circ\cos 20^\circ\cos 40^\circ}{2\sin 10^\circ}$

$=\frac{\cos 40^\circ\sin 40^\circ}{4\sin 10^\circ}=\frac{\sin 80^\circ}{8\sin 10^\circ}=\frac{1}{8}\frac{\cos 10^\circ}{\sin 10^\circ}=\frac{1}{8}\cot 10^\circ$ ۸

(۲)

$\sin\alpha=2-3\cos\alpha \xrightarrow{\text{توان ۲}} \sin^2\alpha=9\cos^2\alpha-12\cos\alpha+4 \to 1=10\cos^2\alpha-12\cos\alpha+4$

$-8=10\cos^2\alpha-12\cos\alpha+5 \to 2=5\cos 2\alpha-12\cos\alpha$ ۹

(۲)

$\frac{a}{\sin A}=\frac{b}{\sin B}=\frac{c}{\sin C} \to \frac{a^2}{\sin^2 A}=\frac{bc}{\sin B\sin C}=\frac{bc}{\cos^2\frac{A}{2}}=\frac{a^2}{\sin^2 A}=\frac{a^2}{4\sin^2\frac{A}{2}\cos^2\frac{A}{2}}$

(۲) ۱۰

$\to bc=\frac{a^2}{4\sin^2\frac{A}{2}} \Rightarrow bc(1-\cos A)=a^2 \to 2bc-2bc\cos A=a^2$

$a^2=b^2+c^2-2bc\cos A \to 2bc-2bc\cos A=b^2+c^2-2bc\cos A \to b^2+c^2-2bc=0$

$\to b=c \to \hat{B}=\hat{C}=72 \to A=180-144=36^\circ$