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نام و نام خانوادگی آرین عضنفری سوادکوهی پاسخنامه تشریحی تکلیف شماره ۱۵ کلاس دوازدهم B

سوالات تکلیف ساده بود اگر با وجود وقت گذاشتن باز هم اشکال دارید تایم رفع اشکال بگیرید!

$T = \frac{\pi}{121} = \frac{\pi}{2} = AC \quad y = \tan(-\frac{3\pi}{4} + \frac{\pi}{4}) = 1 = BO$ $\frac{AC \times BO}{2} = \frac{\frac{\pi}{2} \times 1}{2} = \frac{\pi}{4}$ ✓ (۲)	۱
(۰)	۲
$\log \sin\alpha - \log(-\cos\alpha) = \log 3 \to \log \frac{\sin\alpha}{-\cos\alpha} = \log 3 \to \sin\alpha = -3\cos\alpha$ $\sin^2\alpha + \cos^2\alpha = 1 \to (-3\cos\alpha)^2 + \cos^2\alpha = 1 \to 10\cos^2\alpha = 1,\ \cos^2\alpha = \frac{1}{10} \to \cos\alpha = \pm\frac{1}{\sqrt{10}}$ $\sin\alpha = \frac{3}{\sqrt{10}} \quad \sin\alpha - \cos\alpha = \frac{4}{\sqrt{10}} = 0/4\sqrt{10}$ ✓ (۲)	۳
$\sin^4\theta + \cos^2\theta = \frac{4}{5} \to (1-\cos^2\theta)^2 + \cos^2\theta = \frac{4}{5} \to \cos^4\theta - \cos^2\theta + 1 = \frac{4}{5}$ $\cos^4\theta - 1 + \sin^2\theta + 1 = \frac{4}{5} \to \cos^4\theta + \sin^2\theta = \frac{4}{5}$ (۰)	۴
$\frac{\sin^2}{\cos x} - \frac{1}{\cos} > 0 \quad \frac{\sin^2 - 1}{\cos x} > 0$ (همواره منفی) $\quad \cos x < 0$ ① $\frac{\sin x(3 + \cos x)}{2 - 2\cos^2 x} < 0$ (همواره مثبت) ($2\sin^2 x$ همواره مثبت) $\quad \sin x < 0$ ② $\quad$ ① ∩ ② → ناحیه ۳ ✓ (۲)	۵

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

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

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$\sqrt{1+\sin 50^\circ}=\sqrt{1+\cos 40^\circ}\xrightarrow[1+\cos 40^\circ=2\cos^2 20^\circ]{\text{فرمول طلایی}}\sqrt{2\cos^2 20^\circ}=\sqrt{2}\,|\cos 20^\circ|=\sqrt{2}\cos 20^\circ$

$\sin 50^\circ+\sin 10^\circ=\sin(30^\circ+20^\circ)+\sin(30^\circ-20^\circ)=$

$\sin 30^\circ\cos 20^\circ+\sin 20^\circ\cos 30^\circ+\sin 30^\circ\cos 20^\circ-\sin 20^\circ\cos 30^\circ=2(\tfrac{1}{2})\cos 20^\circ=\cos 20^\circ$

$\frac{\sqrt{2}\cos 20^\circ}{\cos 20^\circ}=\boxed{\sqrt{2}}$

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$1-2\sin^2 a=\cos 2a$
$2\cos^2 a-1=\cos 2a$ } فرمول‌ها

$\cos(2\times 20^\circ)=\cos 40^\circ$

$\frac{1-\tan^2 20^\circ}{1+\tan^2 20^\circ}=\frac{\cos^2 20^\circ-\sin^2 20^\circ}{\underbrace{\cos^2 20^\circ+\sin^2 20^\circ}_{1}}=\cos 40^\circ$

$\underbrace{(\sin 10^\circ)\cos 10^\circ}\times\cos 20^\circ\times\cos 40^\circ=$

$\frac{1}{2}\sin 20^\circ\times\cos 20^\circ\times\cos 40^\circ$

$\frac{1}{2}\times\frac{1}{2}\sin 40^\circ\times\cos 40^\circ=$

$\frac{1}{2}\times\frac{1}{2}\times\frac{1}{2}\sin 80^\circ=\frac{\frac{1}{8}\sin 80^\circ}{\sin 10^\circ}=\frac{1}{8}\cot 10^\circ$ ($\sin 80^\circ \to \cos 10^\circ$)

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$\sin\alpha+2\cos\alpha=2 \to \sin\alpha=2-2\cos\alpha$, $\sin^2\alpha+\cos^2\alpha=1 \to \cos^2\alpha+(2-2\cos\alpha)^2=1 \to$

$\to 10\cos^2\alpha-16\cos\alpha=-3$ $\quad \cos^2\alpha=\frac{1+\cos 2\alpha}{2} \to \cos 2\alpha=2\cos^2\alpha-1 \xrightarrow{\times 5} 5\cos 2\alpha=10\cos^2\alpha-5$

$10\cos^2\alpha-16\cos\alpha-5=-3-5=-8$ ✓

جواب ۸−

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$\cos^2\frac{A}{2}=\frac{1+\cos A}{2} \to 2\sin B\sin C=1+\cos\hat{A} \xrightarrow{A+B+C=\pi} A=\pi-(\hat{B}+\hat{C})$

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

$1-\cos B\cos C+\sin B\sin C=2\sin B\sin C \to \sin B\sin C+\cos B\cos C=1$

$\cos(B-C)=1 \to \begin{cases} B-C=0 \;✓ \\ B-C=2\pi \;\times \end{cases} \to B=C \to A=180^\circ-144^\circ=36^\circ$

$B+C=2B \quad (2\times 72)$

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$x = \frac{r}{R} \rightarrow \left(\frac{r}{R}\right)^2 - \frac{r}{R}\sin\alpha - \frac{\cos^2\alpha}{4} = 0$

$\frac{4}{9} - \frac{r}{R}\sin\alpha - \frac{(1-\sin^2\alpha)}{5} = 0 \rightarrow \frac{9\sin^2\alpha - 9 - 24\sin\alpha + 16}{36} = 0$

$9\sin^2\alpha - 24\sin\alpha + 7 = 0 \xrightarrow{\text{ساده}} \sin^2\alpha - 24\sin\alpha + 7(9) = 0$

$(\sin\alpha - 21)(\sin\alpha - 3) = 0 \rightarrow \sin\alpha = \frac{1}{3}$ ✓ یا ~~$\frac{7}{3}$~~ ✗

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

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