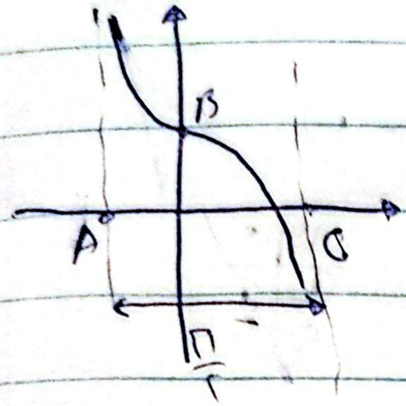
کلاس ... تکلیف (۱۵)

بسم الله الرحمن الرحیم

نیکو حیدری

سوال ۱

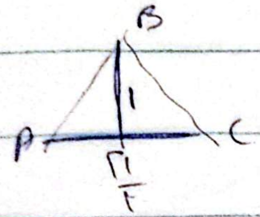
۱۷,۷۵



$\tan(-2\pi + \frac{\pi}{4})$

$T = \frac{\pi}{|2|} \Rightarrow AC = \frac{\pi}{2}$

$B \Rightarrow \tan(\frac{\pi}{4}) = \boxed{1}$



$S = \frac{\pi}{2} \times 1 \times \frac{1}{2} \to \boxed{\frac{\pi}{4}}$

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سوال ۲

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

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

$(x - \frac{1}{2}\sin\alpha)^2 - \frac{1}{4} = 0 \to (x - \frac{1}{2}\sin\alpha)^2 = \frac{1}{4}$

$x - \frac{1}{2}\sin\alpha \begin{cases} \to +\frac{1}{2} \\ \to -\frac{1}{2} \end{cases}$

من به جملات بالا نگاه کردم و اگر اشتباه نکنم تنها حالت
مثبت برقرار است

$x - \frac{1}{2}\sin\alpha = \frac{1}{2} \xrightarrow{x=\frac{2}{3}} \frac{2}{3} - \frac{1}{2}\sin\alpha = \frac{1}{2} \to \frac{1}{6} = \frac{1}{2}\sin\alpha$

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

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

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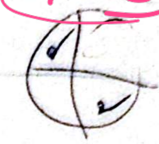
سوال ۳ — ۱٫۷۵

$\log(\sin\alpha) - \log(-\cos\alpha) = \log ۳$

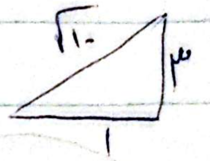
$-\cos\alpha > 0 \to \cos\alpha < 0$

$\log\left(\frac{\sin\alpha}{-\cos\alpha}\right) = \log ۳ \qquad \frac{\sin}{-\cos} > 0 \to \frac{\sin}{\cos} < 0$



$\frac{\sin\alpha}{-\cos\alpha} = ۳ \to \sin\alpha = -۳\cos\alpha$

$\cos\alpha = \frac{-1}{\sqrt{۱۰}}, \quad \sin\alpha = \frac{۳}{\sqrt{۱۰}}$



$\sin - \cos\alpha \to -۴\cos\alpha$

$-۴ \times \frac{1}{\sqrt{۱۰}} \to -\frac{۴}{\sqrt{۱۰}} \qquad -۴\cos\alpha = -۴\left(-\frac{1}{\sqrt{۱۰}}\right) = \frac{۴}{\sqrt{۱۰}}$

سوال ۴ — ۲

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

$\sin^4 - \sin^2 + 1 = \frac{4}{5}$ ①

$\cos^4 + \sin^2 \to (1-\sin^2)^2 + \sin^2 \to 1 + \sin^4 - 2\sin^2 + \sin^2$

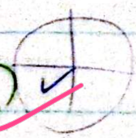
$\sin^4 - \sin^2 + 1 \xrightarrow{①} \sin^4 - \sin^2 + 1 = \boxed{\frac{4}{5}}$

سوال ۵ — ۲

$\frac{۳\sin x + \sin\cos}{۲(1-\cos^2 x)} < 0 \to \frac{۳\sin + \sin\cos}{۲\sin^2} < 0 \xrightarrow{\sin \neq 0}$

همواره مثبت

$\frac{\boxed{۳+\cos}}{۲\sin} < 0 \to \sin < 0$ ① $\qquad$ ①, ②



$\boxed{\text{ناحیه سوم}}$

$\sin \cdot \frac{\sin}{\cos} - \frac{1}{\cos} > 0 \to \frac{\sin^2 - 1}{\cos} > 0 \to \frac{-\cos^2}{\cos} > 0 \xrightarrow{\cos \neq 0} -\cos > 0$

$\to \cos < 0$ ②

سوال ۷

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

$$2\cos=-3\sin \xrightarrow{\div 3\cos} 2=-3\tan \rightarrow \tan=-\frac{2}{3}$$

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$$\tan+\cot \rightarrow \tan+\frac{1}{\tan} \rightarrow -\frac{2}{3}+\left(-\frac{3}{2}\right) \rightarrow \frac{-4-9}{6}$$

$$\boxed{-\frac{13}{6}}$$

سوال ۸

$$(1-2\sin^2 10)(2\cos^2 20-1)\left(\frac{1-\tan^2 40}{1+\tan^2 40}\right) \quad \frac{\frac{\cos^2 40-\sin^2 40}{\cos^2 40}}{\frac{1}{\cos^2 40}}$$

$$\cos 10 \qquad \cos 40$$

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$$\cos 10\times\cos 20\times\cos 40 \rightarrow \times\frac{\sin 10}{\sin 10}\times\cos 10\times\cos 20\times\cos 40 \qquad \tfrac{1}{2}\sin 20 \quad \tfrac{1}{2}\sin 40 \quad \tfrac{1}{2}\sin 80$$

$$\frac{1}{8}\,\frac{\sin 80^{\cos 10}}{\sin 10} \rightarrow \boxed{\frac{1}{8}\cot 10}$$

سوال ۹

$$\sin\alpha+3\cos\alpha=2 \rightarrow (2-3\cos\alpha)^2+\cos^2=1$$

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$$\cancel{\sin^2+4\cos} \qquad 10\cos^2-12\cos\alpha+4=1$$

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

$$5\cos 2\alpha-12\cos\alpha \rightarrow \cos^2-\sin^2\alpha=\cos^2\alpha-(1-\cos^2\alpha)\rightarrow 2\cos^2\alpha-1$$

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

$-c$

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

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

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

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

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