پارسا انوری تکلیف ۱۵

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۱- $f(x)=\tan(-2x+\pi/4) \to f(0)=\tan(\pi/4)=1 \Rightarrow B\Big|^{0}_{1}$

اولین نقاط تعریف نشده مثبت و منفی: $\tan(\pi/2)$ و $\tan(-\pi/2) \Rightarrow -2x+\pi/4=\pm\pi/2 \Rightarrow x = -\pi/8 ,\ 3\pi/8$

$\Rightarrow A\Big|^{-\pi/8}_{0} ,\ C\Big|^{3\pi/8}_{0} \Rightarrow S_{ABC}=\frac{1}{2}(\pi/2)(1)=\pi/4$

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۲- $x=\pi/3 \to \frac{16-24\sin-9\cos^2}{36} \xrightarrow{\cos^2=1-\sin^2} \frac{9\sin^2-24\sin+7}{36}=0 \quad 36\neq 0 \Rightarrow$

$9\sin^2-24\sin+7=0=(3\sin-1)(3\sin-7) \Rightarrow \sin = 7/3$ ✗ , $1/3$ ✓

$\sin=1/3 \Rightarrow \cos^2=1-1/9=8/9 \Rightarrow 1+\tan^2=\frac{1}{\cos^2}=9/8$

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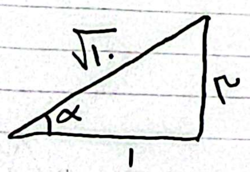
۳- $\log\left(\frac{\sin}{-\cos}\right)=\log(-\tan\alpha)=\log 3 \Rightarrow \tan\alpha=-3$

آرگومان $\log > 0 = D \Rightarrow \sin>0 ,\ \cos<0 \Rightarrow \alpha \to$ ناحیه دوم



$\sin\alpha=\frac{3}{\sqrt{10}}$, $\cos=-\frac{1}{\sqrt{10}}$ $\Rightarrow \sin-\cos=\frac{3-(-1)}{\sqrt{10}}=\frac{4}{\sqrt{10}}=\frac{2\sqrt{10}}{5}$

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۴- $\cos^2=1-\sin^2 \xrightarrow{\text{صورت سوال}} \sin^4-\sin^2+1/5=0 \xrightarrow{\sin^2\alpha=r}$

$r^2-r+1/5=0$ مجموع ریشه‌ها $=\frac{-(-1)}{1}=1 \Rightarrow \sin^2\alpha+\sin^2\beta=1 \Rightarrow$ ریشه‌ها متمم یکدیگرند

$\Rightarrow \sin^4\alpha=\cos^4\beta ,\ \sin^2\alpha=\cos^2\beta \Rightarrow \cos^4\theta+\sin^2\theta=\sin^4\theta+\cos^2\theta=4/5 \Rightarrow$

$\cos^4\theta+\sin^2\theta=4/5$

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۵-

$\frac{3\sin+\sin\cos}{2-2\cos^2} = \frac{\sin(3+\cos)}{2(1-\cos^2)} < 0 \Rightarrow \sin x < 0$

۲ ✓

$\sin\tan - \frac{1}{\cos} = \frac{\sin^2-1}{\cos} = \frac{-\cos^2}{\cos} > 0 \Rightarrow \cos x < 0$

$\Rightarrow$ α در ناحیه ۳

۶-

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

$\cot x = -\frac{3}{2} \Rightarrow \tan x + \cot x = -\frac{2}{3} - \frac{3}{2} = \frac{-13}{6}$

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۷-

تبدیل جمع به ضرب $\sin 50 + \sin 10 = 2\sin(30)\cdot\cos(20)$

مخرج $\rightarrow \cos 20$ (I) / صورت $\Rightarrow 1+\sin 50 = 1+\cos 40 = 1+(2\cos^2 20-1) =$

$\rightarrow 2\cos^2 20$ (II) $\xrightarrow{\text{(I)}\ \text{(II)}}$ $\frac{\sqrt{2\cos^2 20}}{\cos 20} = \sqrt{2}$

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۸-

از طرفی: $\cos 2x = 2\cos^2-1 = 1-2\sin^2 = \frac{1-\tan^2}{1+\tan^2} \Rightarrow$

$\cos 10 \times \cos 20 \times \cos 40 \xrightarrow{\frac{\times \sin 10}{\sin 10}} = \frac{1}{8}\frac{\sin 80}{\sin 10} = \frac{\cot 10}{8} = \frac{\tan 80}{8}$

۲ ✓

~~۷- راه ۲:~~

$\frac{\sqrt{1+\cos 40}}{\sin(20+30)+\sin(30-20)} = \frac{\sqrt{2\cos^2 20}}{2\sin 30\cdot\cos 20} = \frac{\sqrt{2}\cos 20}{\cos 20} = \sqrt{2}$

۲ ✓

$$\sin + 3\cos = 2 \Rightarrow \sin = 2 - 3\cos \Rightarrow \sin^2 = 4 - 12\cos + 9\cos^2 \Rightarrow$$ ۹-

$$\Rightarrow 10\cos^2 - 12\cos + 3 = 0 \Rightarrow 10\cos^2 - 12\cos = -3 \quad \mathrm{I}$$

خواسته سوال : $5\cos 2x - 12\cos = 10\cos^2 - 12\cos - 5 \xrightarrow{\mathrm{I}}$

$$-3 - 5 = -8$$

۲ ✓

$$\sin_B \cdot \sin_C = \cos^2 \frac{A}{2} = \frac{1+\cos \hat{A}}{2} \Rightarrow 2\sin_B \cdot \sin_C = 1 + \cos \hat{A} \Longrightarrow$$ ۱۰-

$$\xrightarrow{\hat{A} = \pi - (B+C)} 2\sin_B \sin_C = 1 + \cos(\pi - (B+C)) = 1 - \cos(B+C) \Rightarrow$$

$$2\sin_B \cdot \sin_C = 1 - \cos_B \cdot \cos_C + \sin_B \cdot \sin_C \Rightarrow \sin_B \cdot \sin_C + \cos_B \cdot \cos_C = 1 \Longrightarrow$$

$$\cos(B-C) = 1 = \cos(0) \Rightarrow B - C = 0 \Rightarrow \hat{B} = \hat{C} = 72 \Rightarrow \hat{A} = 36^\circ$$

۲ ✓