کیانا دهقانی / دوازدهم دختر A — به نام خدا — تکلیف ۱۵:

۱۹/۷۵

(۱) $y=\tan x \to T=\pi$, $y=\tan(-2x+\frac{\pi}{4}) \to T=\frac{\pi}{-2}=-\frac{\pi}{2}$

$AC=$ اندازه یک دوره تناوب $\to AC=-\frac{\pi}{2}$

$B \Rightarrow x=0 \to y=\tan(\frac{\pi}{4})=1 \to OB=1$

$\Big\} \to S=|AC\times OB\times\frac{1}{2}|$

$\to S=|-\frac{\pi}{2}\times 1\times\frac{1}{2}|=+\frac{\pi}{4} \to$ ۴

(۴) ✓

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

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

$\to (x-\frac{1}{2}(\sin\alpha))^2=\frac{1}{4} \to x-\frac{1}{2}(\sin\alpha)=\frac{1}{2} \xrightarrow{x=\frac{1}{3}} \boxed{\sin\alpha=-\frac{1}{3}}$ ق ق

$\to x-\frac{1}{2}(\sin\alpha)=-\frac{1}{2} \xrightarrow{x=\frac{1}{3}} \sin\alpha=\frac{5}{3}$ غ ق

$\boxed{-1\leq \sin\alpha \leq 1}$

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

$\boxed{\frac{1}{\cos^2\alpha}=\frac{9}{8}} \to$ ۱.

(۴) ✓

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$\sin\alpha > 0$ ، $-\cos\alpha > 0 \rightarrow \boxed{\cos\alpha < 0}$

۳

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

$$\rightarrow \frac{\sin\alpha}{\cos\alpha} = \boxed{\tan\alpha = -۳} \rightarrow 1+\tan^۲\alpha = \frac{1}{\cos^۲\alpha} \rightarrow 1+۹ = ۱۰$$

$$\rightarrow \boxed{\cos\alpha = \frac{-1}{\sqrt{۱۰}}} \quad و \quad \sin^۲\alpha = 1-\cos^۲\alpha \rightarrow 1-\frac{1}{۱۰} = \frac{۹}{۱۰}$$

$$\boxed{\sin\alpha = +\frac{۳}{\sqrt{۱۰}}} \Longrightarrow \sin\alpha - \cos\alpha = \frac{۳}{\sqrt{۱۰}} - \left(-\frac{1}{\sqrt{۱۰}}\right) = \frac{۴}{\sqrt{۱۰}} \rightarrow ۲.$$

۴

$$\sin^۴\theta + \cos^۲\theta = \frac{۴}{۵} \xrightarrow{\cos^۲\theta = 1-\sin^۲\theta} \sin^۴\theta - \sin^۲\theta = -\frac{1}{۵}$$

$$\rightarrow \sin^۲\theta(\sin^۲\theta - 1) = -\frac{1}{۵} \rightarrow \boxed{\sin^۲\theta\cos^۲\theta = \frac{1}{۵}}$$

$$\cos^۴\theta + \sin^۲\theta = \cos^۴\theta + 1 - \cos^۲\theta = \cos^۲\theta(\cos^۲\theta - 1) + 1$$

$$= -\cos^۲\theta\sin^۲\theta + 1 = -\frac{1}{۵} + 1 = \frac{۴}{۵} \rightarrow ۲.$$

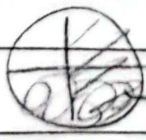
۵

$$\frac{۴\sin x + \sin x\cos x}{۲ - ۲\cos^۲ x} = \frac{\sin x(\overbrace{۴+\cos x}^{+\text{مثبت}})}{۲(1-\cos^۲ x)} = \frac{\sin x(\overbrace{۴+\cos x}^{+\text{مثبت}})}{۲\sin^۲ x}$$

$$= \frac{\overbrace{۴+\cos x}^{+\text{مثبت}}}{۲\sin x} < 0 \rightarrow ۲\sin x < 0 \rightarrow \boxed{\sin x < 0}$$

$$\sin x\tan x - \frac{1}{\cos x} > 0 \rightarrow \frac{1}{\cos x}(\sin^۲ x - 1) > 0 \rightarrow \frac{1}{\cos x}(\overbrace{-\cos^۲ x}^{-\text{منفی}}) > 0$$

$$\rightarrow \boxed{\cos x > 0} \Longrightarrow$$



$\rightarrow \boxed{\text{ربع ۳}} \rightarrow ۱.$

SUBJECT:

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$\frac{2}{\sin x}+\frac{3}{\cos x}=0 \rightarrow \frac{2}{\sin x}=-\frac{3}{\cos x} \rightarrow 2\cos x=-3\sin x$ (4)

$\rightarrow \frac{\sin x}{\cos x}=\boxed{\frac{-2}{3}=\tan x}$, $\tan x=\frac{1}{\cot x} \rightarrow \boxed{\frac{-3}{2}=\cot x}$

$\tan x+\cot x=-\frac{2}{3}-\frac{3}{2}=\frac{-4-9}{6}=-\frac{13}{6} \rightarrow ?$

(2) ✓

صورت $\sqrt{1+\sin 50}=\sqrt{1+\cos 40}=\sqrt{1+\cos^2 20-\sin^2 20}$ (7)

$=\sqrt{2\cos^2 20}=\cos 20\sqrt{2}$

مخرج $=\sin 50+\sin 10=2\sin\left(\frac{50+10}{2}\right)\cos\left(\frac{50-10}{2}\right)$

$=2\sin 30\cos 20=\cos 20$

$\Rightarrow \frac{\cos 20\sqrt{2}}{\cos 20}=\sqrt{2} \rightarrow ?$

(2) ✓

$\sin^2 a=\frac{1-\cos 2a}{2} \rightarrow 2\sin^2 a=1-\cos 2a \rightarrow 1-2\sin^2 a=\cos 2a$ (8)

$\rightarrow 1-2\sin^2 5=\cos 10$

$\cos^2 a=\frac{1+\cos 2a}{2} \rightarrow 2\cos^2 a=1+\cos 2a \rightarrow 2\cos^2 a-1=\cos 2a$

$\rightarrow 2\cos^2 10-1=\cos 20$

$\cos 2a=\frac{1-\tan^2 a}{1+\tan^2 a} \rightarrow \frac{1-\tan^2 20}{1+\tan^2 20}=\cos 40$

$\Rightarrow (\cos 10\times\cos 20\times\cos 40)\times\frac{\sin 10}{\sin 10}=\frac{\frac{1}{8}\sin 80}{\sin 10}=\frac{1}{8}\frac{\cos 10}{\sin 10}$

$\xrightarrow{\cos 80=\sin 10}$ $\frac{1}{8}\cancel{\tan 10} \rightarrow ?$ $\frac{1}{8}\cot 10$ 1,75

Senobar

$\sin\alpha + 3\cos\alpha = 2 \rightarrow \sin\alpha = 2 - 3\cos\alpha$ (9)

به توان ۲ $\rightarrow \sin^2\alpha = 4 + 9\cos^2\alpha - 12\cos\alpha \rightarrow 1 - \cos^2\alpha = 9\cos^2\alpha - 12\cos\alpha + 4$

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

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

$\underbrace{10\cos^2\alpha - 12\cos\alpha}_{-3} - 5 = -8 \rightarrow$ ۴

۲

$\sin B + \sin C = \cos^2\frac{A}{2} \rightarrow \sin B + \sin C = \frac{1+\cos A}{2}$ (10)

$\rightarrow 2\sin B \sin C = \cos A + 1$

$\rightarrow 2\left(\frac{1}{2}\left(\cos(B-C) - \cos(\overset{180-A}{\cancel{B+C}})\right)\right) = \cos A + 1$

$\rightarrow \cos(B-C) + \cos(A) = \cos A + 1 \rightarrow \cos(B-C) = 1$

$B - C = 0 \rightarrow B = C \rightarrow C = 72^\circ, B = 72^\circ$

$\Rightarrow 180 - (B+C) = 180 - 144 = \boxed{A = 36^\circ} \rightarrow$ ۴

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