Year: Month: Day: ۱ / ۱ Subject:

یازدهم تجربی ۵ — پرنیا دیباجی

۱۴,۲۵

① $\frac{1}{\sqrt{\cos^2\alpha}} - \frac{1}{\cot\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \Rightarrow \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|}$

اگر $\cos\alpha < 0$

$\frac{-1-\sin\alpha}{\cos\alpha} = \frac{1-\sin\alpha}{\cos\alpha}$ ✗ ، $\frac{-1+\sin\alpha}{\cos\alpha}$

$\Rightarrow \frac{1-\sin\alpha}{\cos\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha > 0$ (I)

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$\cot\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} \rightarrow \frac{\cos\alpha}{\sqrt{\sin^2\alpha}} = \frac{\cos\alpha}{|\sin\alpha|} \Rightarrow \sin\alpha > 0$ (II)

I و II $\Rightarrow$ ناحیه اول

② $\sin 2x = \frac{m-1}{4}$ $\quad \frac{-\pi}{12} < x < \frac{5\pi}{12} \xrightarrow{\times 2} \frac{-\pi}{6} < 2x < \frac{5\pi}{6}$

$\Rightarrow \frac{-1}{2} < \sin 2x < \frac{1}{2} \Rightarrow -\frac{1}{2} < \frac{m-1}{4} < \frac{1}{2} \xrightarrow{\times 4} -2 < m-1 < 2$

$\Rightarrow -1 < m < 3$

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③ $\tan x + \cot x = -3$ $\quad a^3+b^3 = (a+b)(a^2-ab+b^2)$

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$3\pi < 4x < 4\pi \Rightarrow \frac{3\pi}{4} < x < \pi \Rightarrow 135 < x < 180 \Rightarrow$ ربع ۲

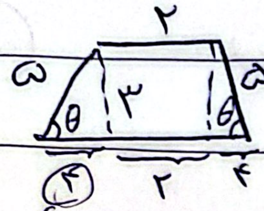
$\frac{1}{\sin^3 x+\cos^3 x} = \frac{1}{(\sin x+\cos x)(1-\sin x\cos x)} = \frac{1}{(\frac{\sqrt3}{3})(1+\frac{1}{3})} = \frac{4}{\sqrt3 \times 4} \Rightarrow \frac{3\sqrt3}{4}$

$\frac{4}{3}$ — غلط

$\tan x + \cot x = -3 \Rightarrow \frac{\sin^2 x+\cos^2 x}{\cos x\sin x} = \frac{1}{\cos x\sin x} = -3 \Rightarrow \cos x\sin x = \frac{-1}{3}$

$(\sin x+\cos x)^2 = \sin^2 x+\cos^2 x+2\sin x\cos x = 1+2\sin x\cos x$

$\Rightarrow 1+(2\times\frac{-1}{3}) = 1-\frac{2}{3} = \frac{1}{3} \Rightarrow \frac{\sqrt3}{3} = \sin x+\cos x$



$\cos\theta = ۰٫۶ \Rightarrow \frac{۶}{۱۰} = \frac{۳}{۵}$ ④

$\cos\theta = \frac{x}{۵} = \frac{۶}{۱۰}$

$\Rightarrow S = \frac{(۱۰+۲)\times ۳}{۲} = ۱۸$

$\sin\theta = \frac{h}{۵} = \frac{۸}{۱۰}$

$S = \frac{(۲+۸)}{۲} \times ۴ = ۲۰$

$۲۵ - ۹ = ۱۶ \Rightarrow \sqrt{x} = ۴$

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⑥ $A = \sqrt{۳}\cos(۲۱۰)\sin(۲۷۰-۲۷) - \sqrt{۲}\sin(۱۳۵)\cos(۱۸۰-۲۷)$

$= \left(\sqrt{۳} \times -\frac{\sqrt{۳}}{۲} \times -\cos ۲۷\right) - \left(\sqrt{۲} \times \frac{\sqrt{۲}}{۲} \times -\cos ۲۷\right)$

$= \left(\frac{۳}{۲} \times \cos ۲۷\right) + \left(\cos ۲۷\right) = \frac{۵\cos ۲۷}{۲} \Rightarrow \frac{۵}{۲}$

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⑤ $\tan(۲۷۰+۱۵)\tan(-۱۸۰+۱۵) - \sin(۳۶۰+۱۵)\cos(۲۷۰-۱۵)$

$= (-\cot ۱۵ \times \tan ۱۵) - (\sin ۱۵ \times -\sin ۱۵) = -۱ + \sin^۲ ۱۵$

$= \sin^۲ ۱۵ - \sin^۲ ۱۵ - \cos^۲ ۱۵ = -\cos^۲ ۱۵ \Rightarrow k = -۱$

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⑦ $f(x) = ۱۶\left[\frac{\sin^۲(۳x)}{\sin^۲(۳x)}\right]\cos^۲(۳x)\cos^۲(۶x)\cos^۲(۱۲x)\cos^۲(۲۴x)$

$\Rightarrow \frac{۱۶ \times \sin^۲\left(\frac{۴۸x}{۳۶}\right)}{۴\times۴\times۴\times۴\times \sin^۲\left(\frac{۳x}{۳۶}\right)} = \frac{\frac{۳}{۴}}{۴\times۴\times۴\times\frac{۲-\sqrt{۳}}{۴}} = ۱۶\times(۲-\sqrt{۳})$

$= \frac{۳}{۱۶(۲-\sqrt{۳})} \times \frac{(۲+\sqrt{۳})}{(۲+\sqrt{۳})} = \frac{۶+۳\sqrt{۳}}{۱۶}$

$\sin^۲\left(\frac{\pi}{۱۲}\right) = \frac{1-\cos\frac{\pi}{۶}}{۲} = \frac{1-\frac{\sqrt{۳}}{۲}}{۲} = \frac{۲-\sqrt{۳}}{۴}$

Month: Day: / / Subject:

(۸)

$$\frac{1-\sin x}{1+\sin x}=4 \Rightarrow 1-\sin x = 4(1+\sin x)$$

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$$\Rightarrow 5\sin x = -3 \Rightarrow \sin x = -\frac{3}{5}$$

$$\sin x = \frac{2\tan\frac{x}{2}}{1+\tan^2\frac{x}{2}} \Rightarrow -\frac{3}{5} = \frac{2\tan\frac{x}{2}}{1+\tan^2\frac{x}{2}} \Rightarrow$$

$$-3\left(1+\tan^2\frac{x}{2}\right) = 10\tan\frac{x}{2} \Rightarrow 3\tan^2\frac{x}{2}+10\tan\frac{x}{2}+3=0$$

$$\Rightarrow \tan\frac{x}{2} = \frac{-10\pm\sqrt{64}}{6} = \frac{-10\pm 8}{6} \Rightarrow \tan\frac{x}{2} = -3$$

مقدار صحیح

(۹)

$$\frac{\sin\theta}{1-\cos\theta}+\frac{1+\cos\theta}{\sin\theta} \Rightarrow \frac{\sin^2\theta+1-\cos^2\theta}{\sin\theta(1-\cos\theta)}$$

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$$\Rightarrow \frac{\sin^2\theta+\sin^2\theta+\cos^2\theta-\cos^2\theta}{\sin\theta(1-\cos\theta)} = \frac{2\sin^2\theta}{\sin\theta(1-\cos\theta)}$$

$$\Rightarrow \frac{2\sin\theta}{1-\cos\theta} = \frac{4\sin\frac{\theta}{2}\cos\frac{\theta}{2}}{2\sin^2\frac{\theta}{2}} = 4\cot\left(\frac{\theta}{2}\right) \Rightarrow k=4$$

(۱۰)

$$\cos\left(\frac{11\pi}{4}+\alpha\right) = \cos\frac{11\pi}{4}\cos\alpha - \sin\frac{11\pi}{4}\sin\alpha$$

ربع ۲

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$$= \left(-\frac{\sqrt{2}}{2}\right)\left(-\frac{7\sqrt{2}}{10}\right) - \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{2}}{10}\right)$$

$$\cos\frac{11\pi}{4} = \cos\left(\pi+\frac{7\pi}{4}\right) = \frac{-\sqrt{2}}{2}$$

$$\cos\pi\cos\frac{7\pi}{4} - \underset{0}{\sin\pi}\sin\frac{7\pi}{4} \Rightarrow \frac{7}{10}-\frac{1}{10} = \frac{6}{10}$$

3) $-\frac{1}{2} < \sin 2x \leq 1 \rightarrow -\frac{1}{2} < \frac{x-1}{4} \leq 1 \rightarrow x \in (-1, 5]$

4) $\frac{\sin^2\theta + (1-\cos^2\theta)}{(1-\cos\theta)\sin\theta} = \frac{2\sin^2\theta}{\sin\theta(1-\cos\theta)} = \frac{2 \times 2 \sin\frac{\theta}{2}\cos\frac{\theta}{2}}{2\sin^2\frac{\theta}{2}} = 2\cot\frac{\theta}{2}$

$\rightarrow k = 2$