۲۸ امیرمحمد نوروزی پایه دهم B ①

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

$\cot\alpha = \frac{\cos\alpha}{|\sin\alpha|} \Rightarrow \frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \Rightarrow \sin\alpha > 0$

→ ربع ۱

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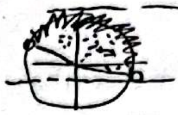
②

$\frac{-\pi}{12} < x < \frac{5\pi}{12} \Rightarrow \frac{-\pi}{6} < 2x < \frac{5\pi}{6} \Rightarrow$



max = 1

min = $-\frac{1}{2}$

$\Rightarrow -\frac{1}{2} < \sin 2x \le 1 \Rightarrow -\frac{1}{2} < \frac{m-1}{4} \le 1 \Rightarrow -2 < m-1 \le 4 \Rightarrow -1 < m \le 5$

$m \in (-1, 5]$

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③

$\tan x - \tan(x+90) = -3 \Rightarrow \frac{2}{\sin 2\alpha} = -3 \Rightarrow \frac{1}{\cos\alpha\sin\alpha} = -3$

$\cot x = -\tan(x+90)$

$\frac{1}{\sin^3\alpha + \cos^3\alpha} = (\sin\theta+\cos\theta)(1-\sin\theta\cos\theta) = (\sin\theta+\cos\theta)(\sin^2\theta+\cos^2\theta+2\sin\theta\cos\theta - 3\sin\theta\cos\theta)$

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④

$\cos\theta = 0.6 \Rightarrow x = 3$

$\Rightarrow h = 4$

$2+2x = 8 \Rightarrow \frac{(8+2)\times 4}{2} = 20$

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⑤

$\tan(270+15)\cdot\tan(-180+15) - \sin(4\pi+15)\cdot\cos(270-15)$

$-\cot(15)\cdot\tan(15) - \sin(15)\cdot(-\sin(15)) \Rightarrow -\cos^2(15) \Rightarrow k = -1$

-1

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⑥

$\sqrt{3}\cos(210)\frac{\sin(240)}{-\cos(27)} - \sqrt{2}\sin(135)\frac{\cos(153)}{-\cos(27)} = A$

$\Rightarrow A = -\cos(27)\left(\frac{\sqrt{3}\cos(210)}{-\frac{3}{2}} - \frac{\sqrt{2}\sin(135)}{-1}\right) = \frac{5}{2}\cos(27)$

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⑦

$f(\frac{\pi}{24}) \times \sin^2(\frac{\pi}{12}) = \sin^2(\frac{\pi}{12}) \times \cos^2(\frac{\pi}{12}) \times \cos^2\frac{\pi}{6} \times \cos^2\frac{\pi}{3} \times \cos^2\frac{2\pi}{3} \times 64 = \sin^2\frac{4\pi}{3}$

$\frac{1}{4}\sin^2\frac{\pi}{6}$ $\quad \frac{1}{16}\sin^2\frac{\pi}{3}$ $\quad \frac{1}{8}\sin^2\frac{2\pi}{3}$

$\frac{\sin^2\frac{4\pi}{3}}{\sin^2\frac{\pi}{12}}$ $\quad \sin^2\frac{\pi}{12} = \frac{1-\cos\frac{\pi}{6}}{2} = \frac{2-\sqrt{3}}{4}$

$$\Rightarrow \frac{\frac{\pi}{4}}{\frac{2-\sqrt{2}}{2}} = \frac{\pi}{2(2-\sqrt{2})} = \frac{4+3\sqrt{2}}{2} \quad \text{or} \quad f\left(\frac{\pi}{12}\right)$$

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(٨)

$$1 - \sin x = 2 + 2\sin x$$

$$\Rightarrow 3\sin x = -1 \Rightarrow \sin x = -\frac{1}{3} \Rightarrow \cos x = -\frac{2\sqrt{2}}{3}$$

$$\tan x = \frac{2\tan\frac{x}{2}}{1-\tan^2\frac{x}{2}} \Rightarrow \frac{1}{2} = \frac{2t}{1-t^2} \Rightarrow 1 - t^2 = 4t$$

$$\Rightarrow t^2 + 4t - 1 = 0 \Rightarrow t = \tan\frac{x}{2} = \frac{-4 \pm \sqrt{20}}{2} = \frac{1}{2}$$

$$\left(\tan\frac{\pi}{8}\right)$$

$$\left[\frac{1}{\tan x}\right] = 0$$

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(۹)

$$\frac{1+\cos\alpha}{\sin\alpha} = \frac{2\cos^2\frac{\alpha}{2}}{2\sin\frac{\alpha}{2}\cos\frac{\alpha}{2}} = \cot\frac{\alpha}{2}$$

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

$$\Rightarrow 2\cot\frac{\alpha}{2} = k\cot\frac{\alpha}{2} \Rightarrow k = 2$$

(۱۰)

$$\sin\alpha = \frac{\sqrt{72}}{10} \Rightarrow \cos\alpha = \frac{-\sqrt{98}}{10}$$

$$\cos\left(\frac{3}{4}\pi+\alpha\right) = \cos\frac{3}{4}\pi\cdot\cos\alpha - \sin\alpha\sin\frac{3}{4}\pi$$

(۳)

$$\frac{1}{\sin x\cos x} = -3 \Rightarrow \sin x\cos x = -\frac{1}{3}$$

$$\sin x > 0 \quad \cos x < 0 \quad \frac{3}{4}\pi < x < \pi$$

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

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

$$\Rightarrow \begin{cases} \sin x+\cos x = \sqrt{1-\frac{2}{3}} \\ \sin x-\cos x = \sqrt{1+\frac{2}{3}} \end{cases}$$

$$\Rightarrow \sin x = \frac{\sqrt{\frac{1}{3}}+\sqrt{\frac{5}{3}}}{2}$$

$$\cos x = \frac{\sqrt{\frac{1}{3}}-\sqrt{\frac{5}{3}}}{2}$$

$$(\sin x+\cos x)(1-\sin x\cos x) = \frac{\sqrt{3}}{2}\cdot\frac{5}{3} = \frac{5\sqrt{3}}{6}$$