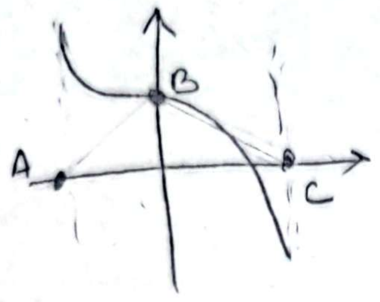
اها ارشدی

(1)



$$y = \tan\left(-2x + \frac{\pi}{4}\right)$$

$$y = \tan\left(\frac{\pi}{4}\right) \rightarrow y = 1 = B$$

$$\frac{\pi}{|b|} \rightarrow \frac{\pi}{|-2|} = \frac{\pi}{2}$$

$$S_{\text{مثلث}} = \frac{\text{قاعده} \times h}{2} \Rightarrow \frac{\pi}{2} \times 1 \times \frac{1}{2} = \frac{\pi}{4}$$

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(2) یکی از ریشه‌ها $\frac{2}{3}$

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

مقدار؟ $= 1 + \tan^2\alpha$

$$\xrightarrow{x = \frac{2}{3}} \left(\frac{2}{3}\right)^2 - \frac{2}{3}(\sin\alpha) - \frac{1}{4}\cos^2\alpha$$

$$\xrightarrow{9 \times 4} 16 - 24\sin\alpha - 9\underbrace{\cos^2\alpha}_{(1-\sin^2\alpha)}$$

$$9\sin^2\alpha - 24\sin\alpha + 7 = 0 \xrightarrow{b^2 - 4ac} (-24)^2 - 4(63) = 18^2$$

$\sin\alpha$: $\frac{24+18}{18}$ غ ق ق چون باید $\sin\alpha \leq 1$

$\frac{24-18}{18} = \frac{1}{3}$ → جواب

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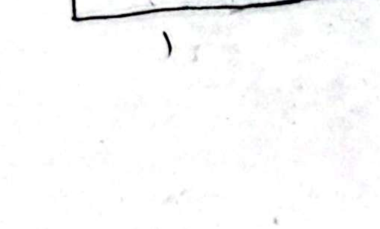
(3)

$$\log^{(\sin\alpha)} - \log^{(-\cos\alpha)} = \log^{3}$$

$\sin\alpha - \cos\alpha = ?$

$$\log^{-\frac{\sin\alpha}{\cos\alpha}} = \log^{3} \rightarrow -\tan\alpha = 3$$



$$\frac{3}{\sqrt{10}} - \frac{1}{\sqrt{10}} \rightarrow \frac{2}{\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}} = \frac{2\sqrt{10}}{10}$$

$$\rightarrow 0.2\sqrt{10}$$

$\sin^{۴}\theta + \cos^{۲}\theta = \frac{۴}{۵}$ $\cos^{۴}\theta + \sin^{۲}\theta = ?$ ۴

$\sin^{۴}\theta - \sin^{۲}\theta + ۱ = \frac{۴}{۵}$

$\longrightarrow \cos^{۴}\theta + \sin^{۲}\theta = \sin^{۴}\theta - ۲\sin\theta + ۱ + \sin^{۲}\theta$

$\longrightarrow \sin^{۴}\theta - \sin\theta + ۱ = \frac{۴}{۵}$

۵

$\frac{۳\sin x + \sin x\cos x}{۲ - ۲\cos^{۲} x} < ۰$ $\sin x \tan x - \frac{۱}{\cos x} > ۰$

$\frac{\sin x \times \sin}{\cos x} - \frac{۱}{\cos x} > ۰$

$\frac{\sin x(۳ + \cos x)}{۲ - ۲(۱ - \sin^{۲})} < ۰$ $\frac{\sin^{۲}}{\cos x} - \frac{۱}{\cos x} > ۰$

$\frac{۱}{\cos x}\left(\frac{\sin^{۲}}{\cos^{۲}} - ۱\right) > ۰ \rightarrow \cos x > ۰$

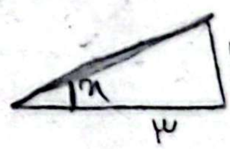
$\frac{\sin x \overbrace{(۴ + \cos x)}^{+}}{\cancel{۲} - \cancel{۲} + \underbrace{۲\sin^{۲}}_{+}} < ۰ \longrightarrow \sin < ۰$

چون cos ها + و sin ها منفی است پس کمان ما در ناحیه ۴ است

جواب

$\frac{۲}{\sin x} + \frac{۳}{\cos x} = ۰$ حاصل $\tan x + \cot x$ را بدست آورید. ۶

$\longrightarrow \frac{۲}{\sin x} = -\frac{۳}{\cos x} \longrightarrow \frac{۲}{-۳} = \frac{\sin x}{\cos x}$ (tan)



$\longrightarrow \tan = -\frac{۲}{۳} \longrightarrow \cot = -\frac{۳}{۲}$

$\tan + \cot \longrightarrow -\frac{۲}{۳} + \left(-\frac{۳}{۲}\right) \Rightarrow \frac{-۴-۹}{۶} = \frac{-۱۳}{۶}$

$$\frac{\sqrt{1+\sin 50}}{\sin 50+\sin 10} \qquad 7$$

$$1+\sin\theta = \left(\sin\frac{\theta}{2}+\cos\frac{\theta}{2}\right)^2$$

$$\longrightarrow \sqrt{\sin 50+1} = \sin 25+\cos 25$$

$$\sin x+\cos x = \sqrt{2}\sin\left(x+\frac{\pi}{4}\right)$$

$$\sin 25+\cos 25 = \sqrt{2}\sin 70 = \sqrt{2}\cos 20$$

$$\sin p+\sin q = 2\sin\left(\frac{p+q}{2}\right)\cos\left(\frac{p-q}{2}\right)$$

$$\xrightarrow{\text{در نتیجه}} \sin 50+\sin 10 = 2\sin 30^\circ\cos 20 = \cos 20$$

$$\longrightarrow \frac{\sqrt{1+\sin 50}}{\sin 50+\sin 10} = \frac{\sqrt{2}\cos 20}{\cos 20} = \sqrt{2}$$ جواب

$$\underbrace{\cancel{(1-2\sin^2 5)}}_{\cos 10}\ \underbrace{\cancel{(2\cos^2 10-1)}}_{\cos 20}\ \underbrace{\cancel{\left(\frac{1-\tan^2 20}{1+\tan^2 20}\right)}}_{\cos 40} \qquad 8$$

$$\longrightarrow (\cos 10\times\cos 20\times\cos 40)\times\frac{\sin 10}{\sin 10}$$

$$\frac{\sin 10\cos 10\cos 20\cos 40}{\sin 10} \;\left(\tfrac{1}{2}\sin 20,\ \tfrac{1}{4}\sin 40\right) = \frac{\frac{1}{8}\sin 80}{\sin 10} \xrightarrow{\text{طبق متمم}} \frac{\cos 10}{\sin 10} = \frac{1}{8}\cot 10$$

$$5\cos 2\alpha-12\cos\alpha \qquad \sin\alpha+3\cos\alpha = 2 \qquad 9$$

$$\sin\alpha = 2-3\cos x \longrightarrow (\sin x+3\cos x)^2 = \sin^2 x+6\sin x\cos x+9\cos^2 x = 4$$

$$(1-\cos^2 x)+9\cos^2 x+6(2-3\cos x)\cos x = 4$$

$$-10\cos^2 x+12\cos x = 3$$

$$5\cos 2x-12\cos x = 5(\cos^2 x-1)-12\cos x \Rightarrow \overbrace{\cancel{10\cos^2 x-12\cos x}}^{-3}-5$$

$$\Rightarrow -8$$ جواب