کاران جابری نژاد یازدهم سری B

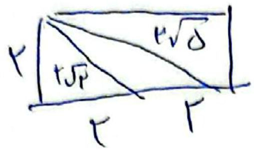
(1

$S = \frac{1}{2} AB \sin\theta \rightarrow 4{,}5 = 0{,}5 \times \sqrt{3} \times 6 \times \sin\theta \rightarrow \sin\theta = \frac{\sqrt{3}}{2}$ (۲)

$\rightarrow \alpha = \frac{\pi}{3}$ یا $\alpha = \frac{2\pi}{3}$ $\quad \alpha < \begin{matrix} 120 \\ 60 \end{matrix} \quad \frac{120}{60} = \boxed{2}$ ✓

(۲

$S = 8$



(۲)

$\frac{1}{2} \times 2\sqrt{2} \times 2\sqrt{5} \times \sin\alpha = 2 \rightarrow \sin\alpha = \frac{1}{\sqrt{10}}, \quad \frac{1}{\sin^2\alpha} = 1 + \cot^2\alpha \rightarrow |\cot\alpha| = 3$ ✓

$\rightarrow \boxed{\cot\alpha = 3}$

(۳ (۲)

$\tan 2\alpha = \frac{2}{x} \quad \tan\alpha = \frac{x}{3} \quad \tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} \rightarrow \frac{2}{x} = \frac{\frac{2x}{3}}{1-\frac{x^2}{9}} \rightarrow x = \frac{3}{2}$

$\rightarrow \cot\alpha = \frac{3}{\frac{3}{2}} = 2$ ✓

(۴ (۲)

$AH^2 = AB^2 - BH^2 \rightarrow AH = \sqrt{7}$

$\underbrace{\tan(\pi - \alpha)}_{-\tan\alpha} = \frac{\sqrt{7}}{3} \rightarrow \boxed{-\tan\alpha = \frac{\sqrt{7}}{3}} \rightarrow \tan\alpha = -\frac{\sqrt{7}}{3}$ ✓

(۵

(۲)

$2\sin^2 x + \cos^2 x = \sin^2 x + 1 = \frac{4}{3} \rightarrow |\sin x| = \sqrt{\frac{1}{3}}$

$\sin^2 + \cos^2 = 1 \xrightarrow[\sin^2 = \frac{1}{3}]{} \cos^2 x = \frac{2}{3} \rightarrow \tan^2 x = \frac{\frac{1}{3}}{\frac{2}{3}} = \boxed{\frac{1}{2}}$ ✓

$\underline{0}$ (۱۴

$$\frac{\sin^۴\alpha + ۴(۱-\sin^۲\alpha)}{۱+(۱-\sin^۲\alpha)} - \frac{\cos^۴\alpha + ۴(۱-\cos^۲\alpha)}{۱+(۱-\cos^۲\alpha)} =$$

$$\frac{(۲-\sin^۲\alpha)^{\cancel{۲}}}{\cancel{۲-\sin^۲\alpha}} - \frac{(۲-\cos^۲\alpha)^{\cancel{۲}}}{\cancel{۲-\cos^۲\alpha}} = \cos^۲\alpha - \sin^۲\alpha = \boxed{\cos ۲\alpha}$$

(۱۷

۲

$$\sin\left(\frac{۹\pi}{۲}+\alpha\right) = \cos\alpha$$

$$-\tan\left(\alpha - \frac{۳\pi}{۲}\right) = \cot\alpha$$

$$\cos\left(\frac{۷\pi}{۲}-\alpha\right) = -\sin\alpha$$

$$A = (\underbrace{\cos\alpha}_{\frac{۳}{۵}})(\overbrace{-\sin\alpha}^{-\frac{۴}{۵}}) + (\cot\alpha) = \frac{-۱۲}{۲۵} + \frac{۳}{۴} = \frac{۷۵-۴۸}{۱۰۰} = \boxed{\frac{۲۷}{۱۰۰}}$$

$$\tan^۲x + ۱ = \frac{۱}{\cos^۲}$$

(۱۸

۲

$$\cos ۶۰ = \cos\frac{\pi}{۳} = \frac{۱}{۲}$$

$$\cos^۲\frac{\pi}{۱۲} = \frac{۱+\cos\frac{\pi}{۶}}{۲} \rightarrow \cos\frac{\pi}{۱۲} = \frac{\sqrt{۲+\sqrt{۳}}}{۲}$$

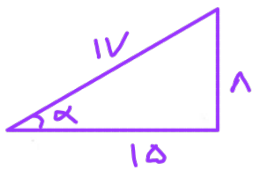
$$\sin^۲\frac{\pi}{۱۲} = \frac{۱-\cos\frac{\pi}{۶}}{۲} \rightarrow \frac{۲-\sqrt{۳}}{۴} \rightarrow \sin\frac{\pi}{۱۲} = \frac{\sqrt{۲-\sqrt{۳}}}{۲}$$

$$\rightarrow ۳\left(\frac{۱}{۲}\right) + \sqrt{۲}\left(\frac{\sqrt{۲-\sqrt{۳}}}{۲} - \frac{\sqrt{۲+\sqrt{۳}}}{۲}\right) = \boxed{\frac{۱}{۲}}$$

(۱۹

$\underline{0}$

$$\tan\alpha = \frac{۲\tan\frac{\alpha}{۲}}{۱-\tan^۲\frac{\alpha}{۲}} = \frac{۸}{۱۵}$$



$$\cos\alpha = \frac{۱۵}{۱۷}$$

$$\sin\alpha = \frac{۸}{۱۷}$$

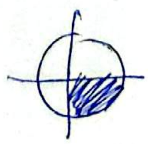
$$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = -\frac{۱۶}{۱۰۵}$$

(۱۰

۲

$$۲\sin\alpha < \sin ۲\alpha \Rightarrow ۲\sin\alpha < ۲\sin\alpha\cos\alpha \xrightarrow[\cos\leq ۱]{۰<\cos<۱} \sin\alpha < ۰$$

$$۰ < \frac{\cot\alpha}{\sin\alpha} \rightarrow \frac{\cos\alpha}{\sin^۲\alpha} > ۰ \rightarrow \cos_\alpha > ۰$$



در ناحیه ۴ می‌باشد.