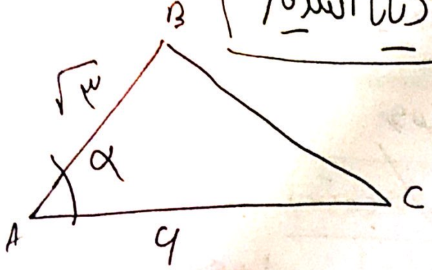
رانا اسدیار

۱۲,۵



(۱)

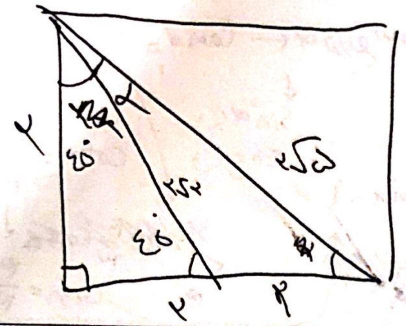
$S_{ABC} = \frac{1}{2} \times \sqrt{3} \times 6 \times \sin A = \frac{3}{2}$

$\sin A = \frac{...}{2} \times \frac{\sqrt{3}}{3}$

۲

زاویه $\hat{} \; max = 120°$

$\alpha \; min = 60°$



$\cot \alpha = \frac{\cos \alpha}{\sin \alpha} = \frac{\frac{3\sqrt{10}}{10}}{\frac{\sqrt{10}}{10}} = 3$ جواب آخر

۲ $\frac{\sqrt{10}}{5}$

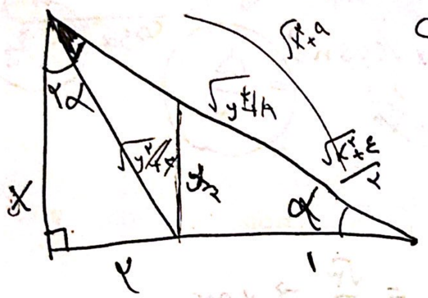
$\cos(\alpha + \frac{\pi}{4}) = \cos \frac{\sqrt{2}}{2} - \sin \frac{\sqrt{2}}{2} \rightarrow \cos\alpha - \sin\alpha$

$\sin(\alpha + \frac{\pi}{4}) = \frac{\sqrt{2}}{2} \; \sin\alpha + \cos\alpha = \frac{2\sqrt{10}}{5}$

$4 + 16 = 20$

(۳)

۵



$\cos 2\alpha = \frac{x^2}{y^2} - \frac{4}{y^2} \rightarrow \frac{x^2-4}{y^2}$

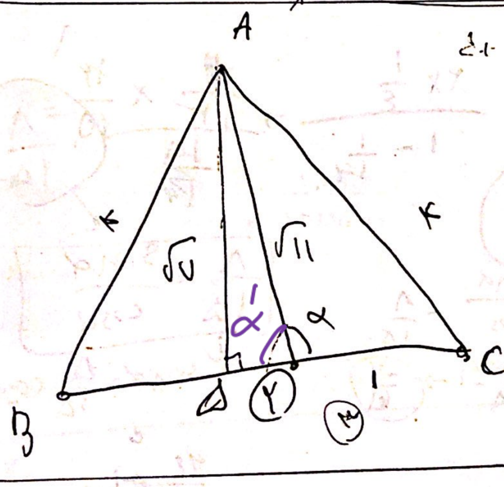
$\sin 2\alpha = 2 \cdot \frac{x}{y} \cdot \frac{4}{y} \rightarrow \frac{8x}{y^2}$

$\frac{x^4 + 16 - 8x^2 + 16x^2}{y^4} = 1 \rightarrow (x^2+4)^2 = y^4 \rightarrow x^2 + 4 = y^2$

$\frac{1}{2} \times 2 \times y \times 1 =$

(۴)

۱,۵



۴-۱-۷

$\tan\alpha = -\tan(180 - \alpha) \rightarrow -\frac{\sin\alpha}{\cos\alpha} \rightarrow \frac{\sqrt{7}}{2}$ $\tan\alpha$

$\tan\alpha' = -\tan\alpha = -\frac{\sqrt{7}}{2}$

$16 - 9 = 7$

(۵)

$2\sin^2 x + \cos^2 x = \frac{4}{3}$

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

$\cos^2 x = \frac{2}{3}$

۲

$\tan^2 x = ? \; \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{1}{3}}{\frac{2}{3}} \rightarrow \frac{1}{2}$

۶

$\frac{\sin^۴\alpha + ۴\cos^۲\alpha}{1+\cos^۲\alpha} - \frac{\cos^۴\alpha + ۴\sin^۲\alpha}{1+\sin^۲\alpha} \to 1 + \sin^۴x + ۲\sin^۲x \quad (1+\sin^۲x)^۲$

$-۲\cos$

$\frac{\sin^۴\alpha + ۴ - ۴\sin^۲x}{۲-\sin^۲\alpha} \to ۲-\sin^۲\alpha - \frac{(\cos^۴\alpha + ۴ - ۴\cos^۲\alpha)}{(۲-\cos^۲\alpha)} = 1$

$1 + \sin^۴x +$

۰٫۵

۷

$\tan\alpha = \frac{۴}{۳}$ ← α در ربع سوم

$+\tan(\frac{۳}{۲}\pi - \alpha)$

$\sin(\frac{۹}{۲}\pi + \alpha) \cdot \cos(\frac{۷\pi}{۲} - \alpha) - \tan(\alpha - \frac{۳}{۲}\pi)$

$\sin\alpha < 0$, $\cos < 0$, $\cot\alpha = \frac{۳}{۴}$

$\cos\alpha \cdot \sin\alpha + \cot\alpha \to \frac{\cos\alpha}{\sin\alpha}$

$\sin^۲\alpha \frac{۹}{۱۶} + \sin^۲\alpha = 1$

$(+)\ \frac{۱۲}{۲۵} + \frac{۳}{۴} = \frac{۱۲۳}{۱۰۰}$ $\frac{۲۷}{۱۶}$

$\sin^۲\frac{۲۵}{۱۶} = 1$

$\cos\alpha = \frac{۳}{۴}\sin\alpha$

$\sin\alpha^۲ = \frac{۱۶}{۲۵} \to \sin\alpha = -\frac{۴}{۵}$

$\cos\alpha = -\frac{۳}{۵}$

۱٫۵

$(۳\cos ۴x + \sqrt{۲}\sin x - \sqrt{۲}\cos x = \frac{۳}{۲} + \sqrt{۲}(\sin x - \cos x)$ $\frac{1}{\sqrt{۲}}$ $= \frac{۵}{۲}$

$۲\cos\frac{\pi}{۳} \to \frac{1}{۲}$

۰٫۵

$x = \frac{\pi}{۱۲} \to \cos ۴\alpha \to \cos(۴ \times \frac{\pi}{۱۲}) = \cos\frac{\pi}{۳} \to \sin\frac{۲\pi}{۱۲} = \frac{\sqrt{۳}}{۲}$ $۲\cos$

$\cos^۲\alpha + \sin^۲\alpha \frac{\pi}{۱۲} = 1$

$\tan(\frac{\alpha}{2}) = \frac{1}{۴} \to \tan(\alpha) = \frac{۲\tan(\frac{\alpha}{2})}{1-\tan^۲(\frac{\alpha}{2})} \to \frac{۲ \times \frac{1}{۴}}{1-\frac{1}{۱۶}} \to \frac{۱}{۲} \times \frac{۱۶}{۱۵} = \frac{۸}{۱۵}$

$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = \frac{\frac{۸}{۱۵} - \frac{۸}{۱۷}}{\frac{۸}{۱۷} - \frac{۵}{۱۷}} = \frac{۸(\frac{۲}{۱۵\times۱۷})}{\frac{۳}{۱۷}} = \frac{۱۶}{۷۵}$

$\frac{\sin\alpha}{\sin\cos} - \frac{۸}{۱۵}$

$\frac{۸}{۱۵} - 1 \to \frac{-۷}{۱۵}$

۱

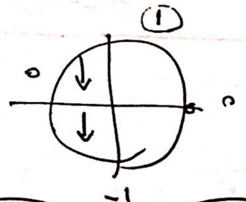
$\frac{۸}{۱۵} = \frac{\sin\alpha}{\cos\alpha}$

$\sin\alpha = \frac{۸}{۱۵}\cos\alpha$

$\frac{۶۴}{۲۲۵} + 1 \to \frac{۲۸۹}{۲۲۵}$ $\cos\alpha = \frac{۱۵}{۱۷}$

$۲\sin\alpha < ۲\sin\alpha\cos\alpha \to$

$0 < \sin\alpha(\cos\alpha - 1)$



$0 < \frac{\cos\alpha}{\sin\alpha^۲} \times$ $\cos\alpha > 0$ $\sin\alpha < 0$ → ربع چهارم

۱

$۲\sin\alpha(۲\cos$ ... $\sin(\frac{\pi}{۹}) \to \frac{1}{۲} = ۲\sin\alpha\cos\alpha$

۳) $\tan B = \frac{AD}{AB} \rightarrow \tan 2\alpha = \frac{2}{x}$ $\quad \tan C = \frac{AB}{AC} \rightarrow \tan\alpha = \frac{x}{3}$

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

۴) $\frac{\sin^4\alpha + 4(1-\sin^2\alpha)}{1+(1-\sin^2\alpha)} - \frac{\cos^4\alpha + 4(1-\cos^2\alpha)}{1+(1-\cos^2\alpha)}$

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

$= \cos 2\alpha$

۱) $\frac{3}{2} + \sqrt{2}\underbrace{\left(\sin\frac{\pi}{12} + \cos\frac{\pi}{12}\right)}_{A}$ $\quad A^2 = 1 - \sin\frac{\pi}{6} = 1 - \frac{1}{2} = \frac{1}{2} \xrightarrow[A<0]{\sqrt{\ }} A = \frac{-1}{\sqrt{2}}$

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

۹) $\tan\alpha = \frac{2\tan\frac{\alpha}{2}}{1-\tan^2\frac{\alpha}{2}} = \frac{8}{15}$ $\quad \cos\alpha = \frac{15}{17}$, $\sin\alpha = \frac{8}{17}$

$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = \frac{\frac{8}{15} - \frac{8}{17}}{\frac{8}{17} - \frac{15}{17}} = \frac{-14}{105}$