نام و نام خانوادگی: سیدرضا لطمانیان کلاس: یازدهم بیر B شماره تکلیف: ۲۷

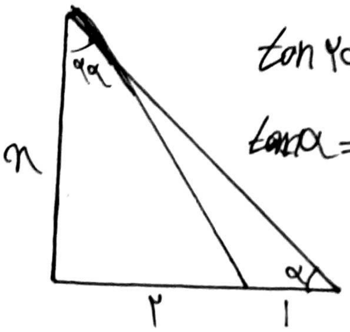
$$S_{\text{مثلث}} = \frac{1}{2} ab \sin\alpha \Rightarrow \frac{1}{2} \times 6 \times \sqrt{3} \times \sin\alpha = \frac{9}{2} \Rightarrow \sin\alpha = \frac{9}{6\sqrt{3}} \Rightarrow \frac{3}{2\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{2}$$

$$\Rightarrow \sin 60, \sin 120 = \frac{\sqrt{3}}{2} \Rightarrow \begin{array}{l}\alpha = 60 \\ \alpha = 120\end{array} \Rightarrow \frac{120}{60} = 2$$ 1

$$2\sin^2 x + \cos^2 x = \frac{4}{3} \Rightarrow \underbrace{\sin^2 x + \cos^2 x}_{1} + \sin^2 x = \frac{4}{3} \Rightarrow \sin^2 x = \frac{1}{3} \Rightarrow \sin x = \frac{\sqrt{3}}{3}$$

$$\sin^2 x + \cos^2 x = 1 \Rightarrow \frac{1}{3} + \cos^2 x = 1 \Rightarrow \cos = \sqrt{\frac{2}{3}} \Rightarrow \frac{\sqrt{2}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{6}}{3}$$ ۵

$$\Rightarrow \tan^2 x = \left(\frac{\frac{\cancel{\sqrt{3}}}{\cancel{3}}}{\frac{\cancel{\sqrt{3}}\sqrt{2}}{\cancel{3}}}\right)^2 = \left(\frac{1}{\sqrt{2}}\right)^2 = \frac{1}{2}$$

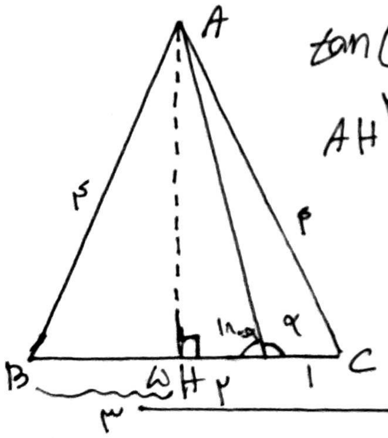


$$\tan 2\alpha = \frac{2}{x} = \frac{2\tan\alpha}{1-\tan^2\alpha} \Rightarrow \frac{\frac{2x}{3}}{1-\frac{x^2}{9}} = \frac{2}{x}$$

$$\tan\alpha = \frac{x}{3}$$ ۳

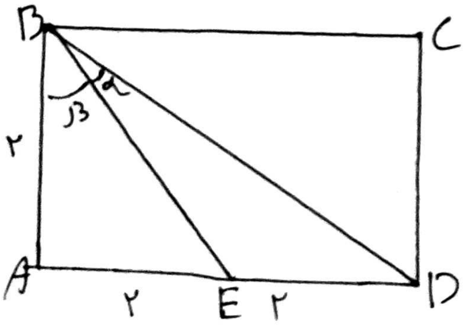
$$\Rightarrow x^2 = \frac{9}{4} \Rightarrow x = \frac{3}{2}$$

$$\Rightarrow \cot\alpha = \frac{3}{\frac{3}{2}} = 2$$



$$\tan(180-\alpha) = \frac{AH}{2} \Rightarrow \tan(180-\alpha) = \frac{\sqrt{7}}{2} \Rightarrow \tan(\alpha) = -\frac{\sqrt{7}}{2}$$

$$AH^2 + HC^2 = AC^2 \Rightarrow AH = \sqrt{16-9} = \sqrt{7}$$ ۴



مثلث $A\hat{B}E$ قائم‌الزاویه است، دو اضلاع قائمه برابرند پس $45^\circ = \beta$

$$\Rightarrow \tan(\alpha+\beta) = \frac{\tan\alpha + \tan\beta}{1-\tan\alpha \times \tan\beta} \Rightarrow$$ ۲

$$2 = \frac{\tan\alpha + 1}{1-\tan\alpha} \Rightarrow \tan\alpha = \frac{1}{3} \Rightarrow \cot\alpha = 3$$

$\sin^4\alpha + 4\cos^2\alpha \Rightarrow \sin^4\alpha + \underbrace{4\cos^2\alpha + 4\sin^2\alpha}_{4} - 4\sin^2\alpha \Rightarrow (\sin^2\alpha - 2)^2$ اتحاد

$$\Rightarrow \frac{(\sin^2\alpha-2)^2}{1+1(1-\sin^2\alpha)} - \frac{(\cos^2\alpha-2)^2}{1+(1-\cos^2\alpha)} = \frac{(2-\sin^2\alpha)^2}{2-\sin^2\alpha} - \frac{(2-\cos^2\alpha)^2}{2-\cos^2\alpha}$$ 6

$$\Rightarrow 2-\sin^2\alpha - 2+\cos^2\alpha = \cos^2\alpha - \sin^2\alpha = \cos 2\alpha$$

$\sin\left(\frac{9\pi}{2}+\alpha\right) = \cos\alpha \quad \cos\left(\frac{7\pi}{2}-\alpha\right) = -\sin\alpha \quad -\tan\left(\frac{3\pi}{2}-\alpha\right) = -\cot\alpha$

$(\cos\alpha \times -\sin\alpha) + \cot\alpha = -\frac{3}{5}\times\frac{4}{5} + \frac{3}{4} = -\frac{12}{25} + \frac{3}{4} = \frac{-48+75}{100} = 0/27$ 7

$\tan\alpha = \frac{4}{3} \Rightarrow 1+\tan^2\alpha = \frac{1}{\cos^2\alpha}$

$\Rightarrow 1+\frac{16}{9} = \frac{1}{\cos^2\alpha} \Rightarrow \cos\alpha = \frac{3}{5}\,,\ \sin\alpha = \frac{4}{5}$ (چون در ناحیه ۳ هستیم هر دو منفی

$3\cos 4\left(\frac{\pi}{12}\right) = 3\cos\frac{\pi}{3} = \frac{3}{2}\,,\ \sqrt{2}(\sin x \cos x) = \sqrt{2}\left(-\sqrt{1-\sin^2 x}\right)$

$\Rightarrow \sqrt{2}\left(-\sqrt{1-\sin^2\frac{\pi}{4}}\right) = \sqrt{2}\times -\frac{1}{\sqrt{2}} = -1 \Rightarrow \frac{3}{2} - 1 = \frac{1}{2}$ 8

$\tan\alpha = \dfrac{2\tan\frac{\alpha}{2}}{1-\tan^2\frac{\alpha}{2}} \Rightarrow \dfrac{\frac{1}{2}}{1-\frac{1}{16}} = \dfrac{8}{15} = \dfrac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha}$ صورت و مخرج تقسیم بر $\cos\alpha$ $\Rightarrow$ 9

$\Rightarrow \dfrac{\frac{\tan\alpha}{\cos\alpha} - \tan\alpha}{\tan\alpha - 1} \Rightarrow \quad 1+\tan^2\alpha = \dfrac{1}{\cos^2\alpha} \Rightarrow 1+\dfrac{64}{225} = \dfrac{1}{\cos^2\alpha} \Rightarrow \cos\alpha = \dfrac{15}{17}$

$$\frac{\frac{\frac{8}{15}}{\frac{15}{17}} - \frac{8}{15}}{\frac{8}{15} - 1} = -\frac{16}{105}$$

$\dfrac{\cot\alpha}{\sin\alpha} > 0 \Rightarrow \dfrac{\frac{\cos\alpha}{\sin\alpha}}{\sin\alpha} > 0 \Rightarrow \dfrac{\cos\alpha}{\sin^2\alpha} > 0 \Rightarrow 0 < \cos\alpha < 1 \Rightarrow 1-\cos\alpha > 0 \Rightarrow$ ناحیه ۱ یا ۴

$2\sin\alpha - \sin 2\alpha < 0 \Rightarrow 2\sin\alpha - 2\sin\alpha\cos\alpha < 0 \Rightarrow 2\sin\alpha(\underbrace{1-\cos\alpha}_{+}) < 0$ 10

$\Rightarrow \sin\alpha < 0 \Rightarrow$ تنها ناحیه چهارم پذیرفتنی است $\Rightarrow$ ناحیه ۴