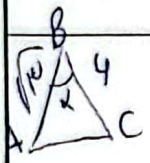
۱۸,۷۵

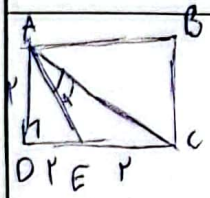
نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....



$S=4\sqrt{3} \Rightarrow S=\frac{1}{2}ab\sin\alpha \Rightarrow \frac{1}{2}ab\sin\alpha=4\sqrt{3} \Rightarrow ab\sin\alpha=9$

$\Rightarrow \sqrt{3}\times 9\times\sin\alpha=9 \Rightarrow \sin\alpha=\frac{\sqrt{3}}{2} \Rightarrow \alpha=60 \quad \alpha=120 \Rightarrow \frac{\alpha_{max}}{\alpha_{min}}=\frac{120}{60}=2$ ✓

۱ — ۲



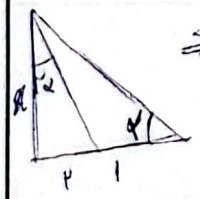
$S_{A\hat{C}D}=\frac{AD\times DC}{2}=4 \qquad S_{A\hat{E}D}=\frac{AD\times DE}{2}=2$

AE و AC از طریق فیثاغورث به راحتی قابل محاسبه هستند

$\Rightarrow \Delta S \Rightarrow S_{A\hat{C}D}-S_{A\hat{E}D}=4-2=2 \Rightarrow \frac{1}{2}\times\sqrt{8}\times\sqrt{20}\times\sin\alpha=S_{ACE}=2$

$\Rightarrow \sin\alpha=\frac{1}{\sqrt{10}} \quad \cos\alpha=\frac{3}{\sqrt{10}} \Rightarrow \cot\alpha=\frac{\cos\alpha}{\sin\alpha}=\frac{\frac{3}{\sqrt{10}}}{\frac{1}{\sqrt{10}}}=3$ ✓

۲ — ۲



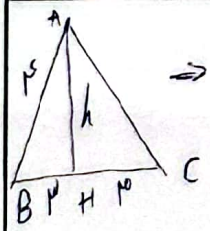
$\Rightarrow \tan 2\alpha=\frac{2}{x} \qquad \tan\alpha=\frac{x}{3}$

$\Rightarrow \tan 2\alpha=\frac{2\tan\alpha}{1-\tan^2\alpha} \Rightarrow \frac{2\left(\frac{x}{3}\right)}{1-\left(\frac{x}{3}\right)^2} \Rightarrow \frac{\frac{2x}{3}}{\frac{9-x^2}{9}}=\frac{2}{x} \Rightarrow \frac{18x}{2(9-x^2)}=\frac{2}{x}$

$\Rightarrow 54-6x^2=18x^2 \Rightarrow 54=24x^2$

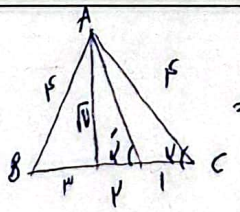
$\Rightarrow x=\frac{3}{2} \Rightarrow \tan\alpha=\frac{\frac{3}{2}}{\frac{3}{1}}=\frac{1}{2} \Rightarrow \cot\alpha=2$ ✓

۳ — ۲



$\Rightarrow 4^2=3^2+h^2 \Rightarrow h=\sqrt{7}$

$\Longrightarrow$



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

$\Rightarrow \tan\alpha'=-\tan\alpha$

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

۴ — ۲

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

$\Rightarrow 9\tan^2+3=4\tan^2\alpha \Rightarrow 3\tan^2\alpha=1 \Rightarrow \tan^2\alpha=\frac{1}{3}$ ✓

۵ — ۲

CamScanner

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

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

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

۲ — ۶

$$\tan\alpha = \frac{4}{3} \Rightarrow 1+\tan^2\alpha = \frac{1}{\cos^2\alpha} \Rightarrow 1+\frac{16}{9} \Rightarrow \frac{1}{\cos^2\alpha} \Rightarrow \cos^2\alpha = \frac{9}{25} \Rightarrow \cos\alpha = -\frac{3}{5}$$

$$\Rightarrow \sin^2\alpha = 1-\cos^2\alpha \Rightarrow \sin^2\alpha = 1-\frac{9}{25} = \frac{16}{25} \Rightarrow \sin\alpha = -\frac{4}{5}$$

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

$$\Rightarrow \cos\alpha \times -\sin\alpha + \cot\alpha \Rightarrow \left(-\frac{3}{4}\right)\left(\frac{4}{5}\right) + \frac{3}{4} \Rightarrow -\frac{12}{25} + \frac{3}{4} = \frac{37}{100}$$

۲ — ۷

$$x = \frac{\pi}{12} \qquad 3\cos 4x + \sqrt{2}\sin x - \sqrt{2}\cos x \Rightarrow 3\cos 4x + \sqrt{2}(\sin x - \cos x)$$

$$\Rightarrow 3\cos 4x + 2\sin\left(x - \frac{\pi}{4}\right) \Rightarrow 3\cos 4x + 2\sin\left(x - \frac{\pi}{4}\right) \Rightarrow x = \frac{\pi}{12}$$

$$\Rightarrow 3\cos\frac{\pi}{3} + 2\sin\left(-\frac{\pi}{6}\right) \Rightarrow 3\left(\frac{1}{2}\right) + 2\left(-\frac{1}{2}\right) \Rightarrow \frac{3}{2} - \frac{2}{2} = \frac{1}{2}$$

۲ — ۸

$$\tan\alpha = \frac{2\tan\frac{\alpha}{2}}{1-\tan^2\frac{\alpha}{2}} \Rightarrow \frac{2\times\frac{1}{4}}{1-\frac{1}{16}} \Rightarrow \frac{\frac{1}{2}}{\frac{15}{16}} \Rightarrow \frac{8}{15}$$

$$\Rightarrow \cos\alpha = \frac{\sin\alpha}{\tan\alpha} = \frac{\frac{8}{17}}{\frac{8}{15}} = \frac{15}{17}$$

$$\sin\alpha = \frac{2\tan\frac{\alpha}{2}}{1+\tan^2\frac{\alpha}{2}} \Rightarrow \frac{2\times\frac{1}{4}}{1+\frac{1}{16}} \Rightarrow \frac{\frac{1}{2}}{\frac{17}{16}} \Rightarrow \frac{8}{17}$$

خواسته سوال ← $\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = \frac{-16}{105}$

۱ — ۹

$$2\sin\alpha < \sin 2\alpha \Rightarrow 2\sin\alpha < 2\sin\alpha\cos\alpha \Rightarrow \sin\alpha < \sin\alpha\cos\alpha$$

$$\Rightarrow \sin\alpha - \sin\alpha\cos\alpha < 0 \Rightarrow \sin\alpha(1-\cos\alpha) < 0 \Rightarrow \sin\alpha < 0$$ دقت!

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

پس در ربع ~~سوم~~ چهارم قرار دارد

۱/۷۵ — ۱۰