نام و نام خانوادگی ...دنیا سادات بصیری... پاسخنامه تشریحی تکلیف شماره ...۲۷... کلاس ...یازدهم دختر...

۱

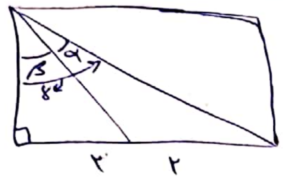
$\text{مساحت} = \frac{1}{\cancel{2}} \times \sin\alpha \times \cancel{2}a \sqrt{3}a = \frac{a^2\sqrt{3}}{2} \rightarrow \sin\alpha = \frac{3a\sqrt{a}}{2\sqrt{3}a\sqrt{a}} = \frac{\sqrt{3}}{2}$

$\rightarrow \alpha_{min} = 60^\circ$

$\rightarrow \alpha_{max} = 120^\circ$

دو برابر

۲

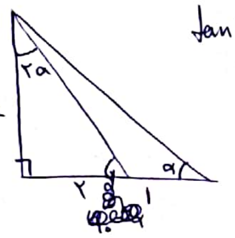


$\tan\alpha = \tan(\gamma - \beta) = \frac{\tan\gamma - \tan\beta}{1 + \tan\gamma \tan\beta} = \frac{\cancel{4}/\cancel{2} - \cancel{2}/1}{1 + \cancel{4}/\cancel{2} \times \cancel{2}/1} = \frac{1}{1+3} = \frac{1}{3}$

$\rightarrow \cot\alpha = 3$

۳

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



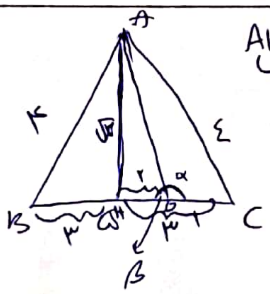
$\tan 2\alpha = \frac{2\tan\alpha}{1 - (\tan\alpha)^2} \Rightarrow \frac{\cancel{2}}{x} = \frac{\cancel{2} \times \frac{x}{3}}{1 - \frac{x^2}{9}} \Rightarrow \frac{1}{x} = \frac{\frac{x}{\cancel{3}}}{\frac{9-x^2}{\cancel{9}3}} \Rightarrow \frac{1}{x} = \frac{3x}{9-x^2} \rightarrow 3x^2 = 9 - x^2$

$4x^2 = 9$

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

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

۴



$AH^2 = 16 - 9 = 7$

$\hookrightarrow \sqrt{7}$

$\tan\beta = \frac{AH}{HB} = \frac{\sqrt{7}}{3} \rightarrow$ از آنجا که α و β مکمل هستند $\rightarrow \tan(\alpha) = \tan(\pi - \beta)$

$= -\tan\beta = -\frac{\sqrt{7}}{3}$

۵

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

$-$

$\sin^2 x + \cos^2 x = 1$

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

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

$$\frac{\sin^4\alpha+4\cos^2\alpha}{1+\cos^2\alpha}-\frac{\cos^4\alpha+4\sin^2\alpha}{1+\sin^2\alpha}=\frac{\sin^4\alpha+4-4\sin^2\alpha}{1+\cos^2\alpha}-\frac{\cos^4\alpha+4-4\cos^2\alpha}{1+\sin^2\alpha}$$

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

$$=2-\sin^2\alpha-2+\cos^2\alpha=\cos^2\alpha-\sin^2\alpha=\cos2\alpha$$ ۶

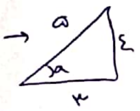
$$\sin\left(\frac{9\pi}{2}+\alpha\right)\cos\left(\frac{7\pi}{2}-\alpha\right)-\tan\left(\alpha-\frac{3\pi}{2}\right)=\cos\alpha\times(-\sin\alpha)+\cot\alpha=\frac{-3}{5}\times\left(\frac{4}{5}\right)+\frac{3}{4}$$

$$\sin\left(4\pi+\frac{\pi}{2}+\alpha\right)=\sin\left(\frac{\pi}{2}+\alpha\right)\qquad\cos\left(4\pi-\frac{\pi}{2}-\alpha\right)=\cos\left(\frac{-\pi}{2}-\alpha\right)=\cos\left(\alpha+\frac{\pi}{2}\right)$$

$$\tan\left(\alpha-\frac{3\pi}{2}\right)=-\tan\left(\frac{3\pi}{2}-\alpha\right)=-\cot\alpha$$

$$=\frac{-12}{25}+\frac{3}{4}=\frac{-48+75}{100}=\frac{27}{100}$$ ۷

$\tan\alpha=\frac{4}{3}\rightarrow$



$\sin\alpha=\frac{-4}{5}$

$\cos\alpha=-\frac{3}{5}$

$\cot\alpha=\frac{3}{4}$

$$3\cos4x+\underbrace{\sqrt2\sin x-\sqrt2\cos x}=3\cos\frac{4\pi}{\cancel{4}\times3}+(-1)=3\times\frac{1}{2}-1=\frac{1}{2}$$

$$\sqrt2(\sin x-\cos x)=\sqrt2\times\sqrt2\left(\sin\left(x-\frac{\pi}{4}\right)\right)=-2\sin\frac{\pi}{6}=-2\times\frac{1}{2}=-1$$ ۸

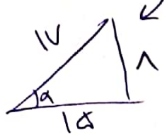
$$\frac{\pi}{12}-\frac{\pi}{4}=-\frac{\pi}{6}$$

$$\tan\left(\frac{\alpha}{2}\right)=\frac{1}{4}$$

$$\tan^2\left(\frac{\alpha}{2}\right)=\frac{1-\cos\alpha}{1+\cos\alpha}\Rightarrow\frac{1}{16}=\frac{1-\cos\alpha}{1+\cos\alpha}\Rightarrow1+\cos\alpha=16-16\cos\alpha$$

$$17\cos\alpha=15\rightarrow\cos\alpha=\frac{15}{17}$$

$$\frac{\tan\alpha-\sin\alpha}{\sin\alpha-\cos\alpha}=\frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}}=\frac{\frac{16}{15\times\cancel{17}}}{\frac{-\cancel{119}\,7}{\cancel{17}\times\cancel{17}}}=\frac{-16}{105}$$ ۹



$\sin\alpha=\frac{8}{17}$

$\tan\alpha=\frac{8}{15}$

$$2\sin\alpha<\sin2\alpha\rightarrow2\sin\alpha<2\sin\alpha\cos\alpha\rightarrow\underbrace{2\sin\alpha}_{\text{منفی}}\underbrace{(\cos\alpha-1)}_{\text{منفی}}>0$$

$$0<\frac{\cot\alpha}{\sin\alpha}\rightarrow\frac{\frac{\cos\alpha}{\sin\alpha}}{\sin\alpha}>0\rightarrow\frac{\cos\alpha}{\sin^2\alpha}>0$$ ۱۰

مثبت ؟

مثبت ؟

$\cos\alpha$ مثبت

$\sin\alpha$ منفی $\Big\}\rightarrow$ ناحیه چهارم