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

$$\frac{1-\cancel{2\cos^2\alpha}+\cos^4\alpha+\cancel{4\cos^2\alpha}}{\cos^2\alpha+1}\ (+2\cos^2\alpha) = \frac{(\cos^2\alpha+1)^2}{\cancel{\cos^2\alpha+1}} = \cos^2\alpha+1 \quad / \quad \frac{1-\cancel{2\sin^2\alpha}+\sin^4\alpha+\cancel{4\sin^2\alpha}}{\sin^2\alpha+1} \xrightarrow{+2\sin^2\alpha} = \frac{(\sin^2\alpha+1)^2}{\sin^2\alpha+1} = \sin^2\alpha+1$$

$$\cos^2\alpha+\cancel{1}-\sin^2\alpha-\cancel{1} = \cos^2\alpha-\sin^2\alpha = \underline{\cos 2\alpha}$$

(۶)

$$\tan\alpha=\frac{4}{3} \longrightarrow \text{(5, 4, 3)} \Rightarrow \begin{cases}\sin\alpha=\frac{-4}{5}\\ \cos\alpha=\frac{-3}{5}\end{cases}$$

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

$$\Rightarrow \frac{-12}{25}+\frac{3}{4}=\frac{-48+75}{100}=\underline{0.27}$$

(۷)

$$x=\frac{\pi}{12}:\quad \underbrace{3\cos\left(4\times\frac{\pi}{12}\right)}_{\cos\frac{\pi}{3}=\frac{1}{2}}+\sqrt{2}\underbrace{\left(\sin\frac{\pi}{12}-\cos\frac{\pi}{12}\right)} = \frac{3}{2}+\cancel{\sqrt{2}}\times\left(-\cancel{\sqrt{2}}\times\frac{1}{\cancel{2}}\right)=\frac{3}{2}-1=\underline{\frac{1}{2}}$$

$$\sqrt{2}\times\sin\underbrace{\left(\frac{\pi}{12}-\frac{\pi}{4}\right)} \longrightarrow \sqrt{2}\sin\left(\frac{-\pi}{6}\right)=-\sqrt{2}\sin\frac{\pi}{6}\ \frac{1}{2}$$

$$\frac{1-3}{12}\pi=\frac{-2\pi}{12}=\frac{-\pi}{6}$$

(۸)

$$\tan\left(\frac{\alpha}{2}\right)=\frac{1}{4} \longrightarrow \text{(}\sqrt{17}, 1, 4\text{)} \Rightarrow \begin{cases}\cos\left(\frac{\alpha}{2}\right)=\frac{4}{\sqrt{17}}\\ \sin\left(\frac{\alpha}{2}\right)=\frac{1}{\sqrt{17}}\end{cases} \longrightarrow \sin\alpha=2\sin\frac{\alpha}{2}\cdot\cos\frac{\alpha}{2}=2\times\frac{4}{\sqrt{17}}\times\frac{1}{\sqrt{17}}=\frac{8}{17}$$

$\alpha=2x$, $\frac{\alpha}{2}=x$

$$\frac{\tan\alpha-\sin\alpha}{\sin\alpha-\cos\alpha}=?\qquad \Rightarrow \underline{\sin\alpha=\frac{8}{17}} \Rightarrow \text{(17, 8)} \Rightarrow x=\sqrt{17^2-8^2}=\sqrt{225}=15$$

$$\Rightarrow \cos\alpha=\frac{15}{17} \qquad \Rightarrow \frac{\frac{8}{15}-\frac{8}{17}}{\frac{8-15}{17}} = \frac{\frac{8\times 2}{17\times15}}{\frac{-7}{17}} = \underline{\frac{-16}{105}}$$

(۹)

$$2\sin\alpha<\underbrace{\sin2\alpha}_{2\sin\alpha.\cos\alpha} \Rightarrow 2\sin\alpha-2\sin\alpha.\cos\alpha<0 \longrightarrow 2\sin\alpha\times\underbrace{(1-\cos\alpha)}_{+}<0 \Rightarrow 2\sin\alpha<0$$

$$\Rightarrow \underline{\sin\alpha<0}$$

ناحیه ۳و۴

$$\Rightarrow \frac{\cot\alpha}{\sin\alpha}>0 \quad \left(\cot\alpha\to\frac{\cos\alpha}{\sin\alpha}\right) \Rightarrow \frac{\cos\alpha}{\sin^2\alpha}>0 \longrightarrow \underline{\cos\alpha>0} \longrightarrow$$ ناحیه ۱و۴

⇐ ناحیه ۴ام !

(۱۰)

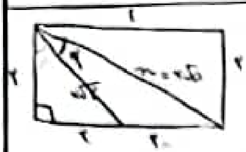
نام و نام خانوادگی ....هستی عباسی................ پاسخنامه تشریحی تکلیف شماره ..۲۷... کلاس ..یازدهم تجربی A..................

①

$S = \frac{1}{2} bc\sin\alpha \Rightarrow \frac{1}{2} \times \sqrt{3} \times 2 \times \sin\alpha = \frac{3}{2} \to \sin\alpha = \frac{3}{2\sqrt{3}} = \frac{\sqrt{3}}{2} \to \sin\alpha = \frac{\sqrt{3}}{2} \to \alpha = 120$ یا 60

$\Rightarrow \frac{120}{60} = 2$ برابر

②



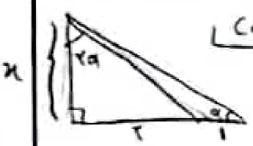
$x = 2\sqrt{1+2^2} = 2\sqrt{5}$ (طبق فیثاغورث)

$2 = \sqrt{8+20-2\times 2\sqrt{2}\times 2\sqrt{5}\times\cos\alpha} \Rightarrow 4 = 28 - 8\sqrt{10}\cos\alpha \to \frac{3}{\sqrt{10}} = \cos\alpha \to$

$\sqrt{10-9} = 1$

$\Rightarrow \cot\alpha = 3$

③



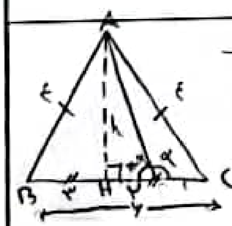
$\cot\alpha = ?$

$\Rightarrow \cot\alpha = \frac{3}{x} \quad , \quad \cot 2\alpha = \frac{x}{2} \to \cot 2\alpha = \frac{\cot\alpha - \tan\alpha}{2}$

$\Rightarrow \cancel{\cot\alpha} = x + \cancel{\tan\alpha} \xrightarrow{\times x} 3 = x^2\left(1+\frac{1}{3}\right) \to x^2 = \frac{9}{4} \to x = \frac{3}{2}$

$\to \cot\alpha = \frac{3}{3/2} = 2$

④



$\to$ ارتفاع در مثلث متساوی الساقین همون میانه است، طبق فیثاغورث داریم:

$\tan\alpha = ?$

$h = \sqrt{16-9} = \sqrt{7} \to (4^2 = 3^2 + h^2)$

$\Rightarrow \tan(\pi - \alpha) = -\tan\alpha = \frac{\sqrt{7}}{2} \to \tan\alpha = \frac{-\sqrt{7}}{2}$

⑤

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

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

$\Rightarrow \sin^2 x + 1 = \frac{4}{3} \to \sin^2 x = \frac{1}{3} \to \cos^2 x = 1 - \sin^2 x \to \cos^2 x = \frac{2}{3}$

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