نام و نام خانوادگی ...شاربیا جعفری...... پاسخنامه تشریحی تکلیف شماره ..۲۷.. کلاس ...یازدهم تجربی B......

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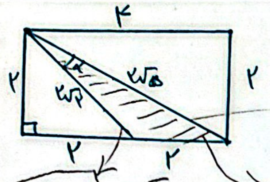
$S = 4/5$

$\sqrt{3} \,,\, 6$

$S = \frac{1}{2} ab \sin\alpha \longrightarrow \frac{1}{\cancel{2}} \times \cancel{6}^{3} \times \sqrt{3} \times \sin\alpha = \frac{\cancel{9}^{3}}{\cancel{2}}$

$\sin\alpha = \frac{3}{2\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{2} \longrightarrow \alpha = 60^\circ$ یا $120^\circ \quad \frac{max}{min} = \frac{120}{60} = 2$

۲



$\sqrt{4^2+2^2} = \sqrt{20} = 2\sqrt{5}$

$\sqrt{2^2+2^2} = 2\sqrt{2}$

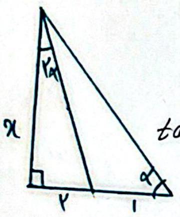
قضیه کسینوس ها $\rightarrow 2 = \sqrt{(2\sqrt{2})^2 + (2\sqrt{5})^2 - 2 \times 2\sqrt{2} \times 2\sqrt{5} \times \cos\alpha}$

$2 = \sqrt{28 - 8\sqrt{10}\cos\alpha} \Rightarrow 4 = 28 - 8\sqrt{10}\cos\alpha$

$8\sqrt{10}\cos\alpha = 24$

$\cos\alpha = \frac{\cancel{24}^{3}}{\cancel{8}\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}} = \frac{3\sqrt{10}}{10}$

۳



$\cot\alpha = ?$

$\tan\alpha = \frac{x}{3}$

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

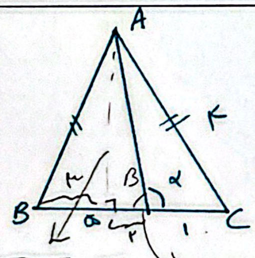
$\frac{9-x^2}{9}$

$\frac{\cancel{9}^{3}x}{9-x^2} = \frac{2}{x}$

$3x^2 = 9 - x^2 \Rightarrow 4x^2 = 9$

$x^2 = \frac{9}{4} \quad x = \pm\frac{3}{2} \longrightarrow x = \frac{3}{2} \qquad \cot\alpha = \frac{6}{3} = 2$

۴



$\tan\alpha = ?$

$\alpha = \pi - \beta$

$\sqrt{4^2-3^2} = \sqrt{7}$

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

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

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

$1 + \cot^2 x = \frac{1}{\sin^2 x} \qquad \cot^2 x = 3 - 1 = 2 \qquad \tan^2 x = \frac{1}{2}$

$$\frac{\sin^4 x+4\cos^2\alpha}{1+\cos^2\alpha}-\frac{\cos^4\alpha+4\sin^2\alpha}{1+\sin^2\alpha}=\frac{(1-\cos^2\alpha)^2+4\cos^2\alpha}{1+\cos^2\alpha}-\frac{(1-\sin^2\alpha)^2+4\sin^2\alpha}{1+\sin^2\alpha}$$ ۶

$(1-\cos^2\alpha)^2 \quad (1-\sin^2\alpha)^2$

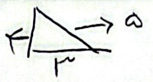
$1+\cos^4\alpha-2\cos^2\alpha+4\cos^2\alpha=1+2\cos^2\alpha+\cos^4\alpha\to(\cos^2\alpha+1)^2$

$1+\sin^4\alpha-2\sin^2\alpha+4\sin^2\alpha=1+2\sin^2\alpha+\sin^4\alpha\to(\sin^2\alpha+1)^2$

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

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

$\tan\alpha=\frac{4}{3}\quad \alpha\longrightarrow$ ربع سوم



$\cos\alpha=\frac{-3}{5}\quad \sin\alpha=-\frac{4}{5}\quad \cot\alpha=\frac{3}{4}$

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

$\sin(\frac{\pi}{2}+\alpha)\cos(\frac{3\pi}{2}-\alpha)-\tan(\alpha-\frac{3\pi}{2})$ ۷

$\cos\alpha\times-\sin\alpha+\cot\alpha$

$\frac{-3}{5}\times-(-\frac{4}{5})+\frac{3}{4}=\frac{-12}{25}+\frac{3}{4}=\frac{-48+75}{100}=\frac{27}{100}$

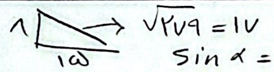
$(3\cos4x+\sqrt{2}\sin x-\sqrt{2}\cos x)\quad if\ x=\frac{\pi}{12}$

$3\cos(\frac{\pi}{3})+\sqrt{2}\sin(\frac{\pi}{12})-\sqrt{2}\cos(\frac{\pi}{12})=\quad 3\cos(\frac{\pi}{3})+\sqrt{2}\times\sqrt{2}\sin(-\frac{\pi}{6})$

$\sqrt{2}(\underbrace{\sin\frac{\pi}{12}-\cos\frac{\pi}{12}})\qquad 3\times\frac{1}{2}+2\times-\frac{1}{2}=\frac{3}{2}-1=\frac{1}{2}$ ۸

$\sqrt{2}\sin(x-\frac{\pi}{4})\to\sqrt{2}\sin(\underbrace{\frac{\pi}{12}-\frac{\pi}{4}}_{-\frac{\pi}{6}})$

$\tan(\frac{\alpha}{2})=\frac{1}{4}\qquad \frac{\tan\alpha-\sin\alpha}{\sin\alpha-\cos\alpha}=$



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

$\tan\alpha=\frac{2\tan(\frac{\alpha}{2})}{1-\tan^2(\frac{\alpha}{2})}\Rightarrow\tan\alpha=\frac{2\times\frac{1}{4}}{1-\frac{1}{16}}=\frac{\frac{1}{2}}{\frac{15}{16}}=\frac{8}{15}\qquad \frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}}=\frac{\frac{8(17-15)}{17\times15}}{\frac{-7}{17}}$ ۹

$\frac{-16}{105}$

$2\sin\alpha<\sin2\alpha\quad , \quad 0<\frac{\cot\alpha}{\sin\alpha}$ α در کدام ربع؟

$\frac{\frac{\cos x}{\sin x}}{\frac{\sin x}{1}}>0\Rightarrow\frac{\cos\alpha}{\sin^2\alpha}>0\Rightarrow\boxed{\cos\alpha>0}\ (1)\to 0<\cos<1$

$(1),(2)\longrightarrow$ α ناحیه چهارم ۱۰

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

اگر $0<\sin$ ← چون در $\cos\alpha$ بین صفر و ۱ است ضرب شده کوچکتر خواهد شد، پس $\sin$ باید منفی باشد $\Rightarrow\boxed{\sin\alpha<0}\ (2)$