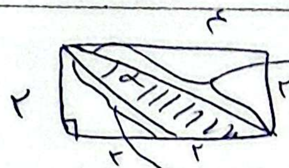
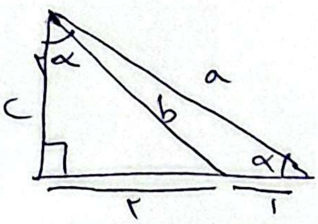
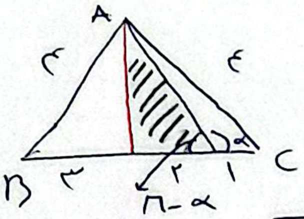
نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره ۲۷ ...... کلاس ....

۱	$\frac{1}{2}\times 6\times\sqrt{3}\times\sin\alpha = 4/5$ $\quad \sin\alpha = \frac{9}{6\sqrt{3}} = \frac{\sqrt{3}}{2}$ $\sin\alpha = \frac{\sqrt{3}}{2} \Rightarrow \begin{cases}\alpha = \frac{\pi}{3}\\ \alpha = \frac{2\pi}{3}\end{cases} \Rightarrow \frac{\alpha_{max}}{\alpha_{min}} = \frac{\frac{2\pi}{3}}{\frac{\pi}{3}} = 2$
۲	 $2^2+4^2=20$ ضلع مورد نظر $=\sqrt{20}$ $2^2+2^2=8$ ضلع مورد نظر $=\sqrt{8}$ $S_\alpha = 8-2-4=2$ $\quad 2=\frac{1}{2}\times 2\sqrt{2}\times 2\sqrt{5}\times\sin\alpha \Rightarrow$ $\sin\alpha=\frac{1}{\sqrt{10}}$ با مثلث $(\sqrt{10})^2=(1)^2+x^2 \quad x=3$ $\quad \cot\alpha=\frac{3}{1}=3$
۳	 $\cos 2\alpha=\cos^2\alpha-\sin^2\alpha$ $\sin 2\alpha = 2\sin\alpha\cos\alpha$ $\frac{c}{b}=\left(\frac{3}{a}\right)^2-\left(\frac{c}{a}\right)^2 \Rightarrow \frac{9-c^2}{a^2}=\frac{c}{b}$ (I) $\frac{2}{b}=2\times\frac{c}{a}\times\frac{3}{a} \Rightarrow a^2=3bc$ (II) (I) , (II) $\Rightarrow \frac{9-c^2}{3bc} \Rightarrow c=\frac{3}{2}$ $\quad \cot\alpha=\frac{3}{c}=\frac{3}{\frac{3}{2}}=2$
۴	 ارتفاع وارد بر قاعده رسم شد $AB^2=AH^2+BH^2$ $16=(AH)^2+9 \Rightarrow (AH)^2=7$ $\Rightarrow AH=\sqrt{7}$ در مثلث هاشوری $\Rightarrow \tan(\pi-\alpha)=\frac{\sqrt{7}}{2} \Rightarrow -\tan\alpha=\frac{\sqrt{7}}{2} \Rightarrow \tan\alpha=-\frac{\sqrt{7}}{2}$
۵	$2\sin^2x+\cos^2x=\frac{4}{3} \Rightarrow \sin^2x+\cos^2x=1$ $\sin^2x+\sin^2x$ $\Rightarrow \sin^2x=\frac{4}{3}-1=\frac{1}{3} \Rightarrow \cos^2x=1-\sin^2x$ $=\frac{3}{3}-\frac{1}{3}=\frac{2}{3} \Rightarrow \tan^2x=\left(\frac{\sin x}{\cos x}\right)^2=\frac{\sin^2x}{\cos^2x}=\left(\frac{\frac{1}{3}}{\frac{2}{3}}\right)=\frac{1}{2}$

ادامه ادامه (۷)

$-\sin\alpha\cos\alpha + \cot\alpha = -(-\frac{3}{5})(-\frac{4}{5}) + \frac{3}{4}$

$= \frac{-12}{25} + \frac{3}{4} = \frac{37}{100} = 0/37$

عارضه فصل ...

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

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

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

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

$\sin(\frac{9\pi}{2} + \alpha)\cos(\frac{7\pi}{2} - \alpha) + \tan(\frac{3\pi}{2} - \alpha)$ ۷

$= \cos\alpha \times (-\sin\alpha) + \cot\alpha = -\sin\alpha\cos\alpha + \cot\alpha$

$\cot\alpha = \frac{3}{4}$ ← در ربع ۳ α ← $\tan\alpha = \frac{4}{3}$

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

(ادامه در پایین صفحه)

$3\cos 4x + \sqrt{2}(\sin x - \cos x)$

میشود $\sqrt{2}\sin(x - \frac{\pi}{4})$

$= 3\cos 4x + 2\sin(x - \frac{\pi}{4})$ ۸

$\xrightarrow{x = \frac{\pi}{12}} 3\cos(\frac{\pi}{3}) + 2\sin(\frac{\pi}{12} - \frac{\pi}{4}) = 3 \times \frac{1}{2} + 2 \times \frac{-1}{2} = \boxed{\frac{1}{2}}$

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

$\tan(\frac{\alpha}{2}) = \frac{1}{4} \qquad \sin(\alpha) = \frac{2\tan(\frac{\alpha}{2})}{1+\tan^2(\frac{\alpha}{2})} = \frac{2(\frac{1}{4})}{1+\frac{1}{16}} = \frac{\frac{1}{2}}{\frac{17}{16}} = \frac{8}{17}$

$\cos(\alpha) = \frac{1-\tan^2(\frac{\alpha}{2})}{1+\tan^2(\frac{\alpha}{2})} = \frac{1-\frac{1}{16}}{1+\frac{1}{16}} = \frac{\frac{15}{16}}{\frac{17}{16}} = \frac{15}{17}$ ۹

$\tan(\alpha) = \frac{\sin\alpha}{\cos\alpha} = \frac{\frac{8}{17}}{\frac{15}{17}} = \frac{8}{15} \qquad \frac{\frac{8}{15} - \frac{8}{17}}{\frac{8}{17} - \frac{15}{17}} = \frac{8(\frac{1}{15} - \frac{1}{17})}{\frac{-7}{17}} = \frac{8(\frac{2}{15\times17})}{\frac{-7}{17}} = \frac{-8\times2}{15\times7} = \boxed{\frac{-16}{105}}$

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

$\sin\alpha < \sin\alpha\cos\alpha$ ناحیه ۱ و ۴ (I)

$0 < \frac{\cot\alpha}{\sin\alpha} \Rightarrow 0 < \frac{\frac{\cos\alpha}{\sin\alpha}}{\frac{\sin\alpha}{1}} = \frac{\cos\alpha}{\sin^2\alpha} \qquad 0 < \frac{\cos\alpha}{\sin^2\alpha}$ پس $\cos\alpha > 0$ (همواره +)

$\sin\alpha - \sin\alpha\cos\alpha < 0 \longrightarrow \sin\alpha(1 - \cos\alpha) < 0$ (همواره نامنفی) ناحیه ۴

$\sin\alpha < 0 \longrightarrow$ ناحیه ۳ و ۴ (II) $\qquad$ (I) ∩ (II)

ادامه (۷)

$\Rightarrow \frac{9}{25} = \frac{1}{\cos^2\alpha} \xrightarrow{\text{جذر}} \cos\alpha = -\frac{3}{5} \qquad \sin^2\alpha + \cos^2\alpha = 1$

$\sin^2\alpha + \frac{9}{25} = 1 \Rightarrow \sin^2\alpha = \frac{16}{25} \xrightarrow{\text{جذر}} \sin\alpha = -\frac{4}{5}$

(ادامه در بالا)