نام و نام خانوادگی: مهر یالی فارسانی   تکلیف شماره: ۱۸   نام کلاس: دهم پسر A

الف) $\tan\left(2\pi+\frac{3\pi}{4}\right)+\sin\left(2\pi+\frac{7\pi}{4}\right)\times\cos\left(2\pi+\frac{5\pi}{4}\right)$

$=\tan\frac{3\pi}{4}+\sin\frac{7\pi}{4}\times\cos\frac{5\pi}{4}=-1+\left(-\frac{\sqrt{2}}{2}\right)\left(-\frac{\sqrt{2}}{2}\right)=-1+\frac{1}{2}=\boxed{-\frac{1}{2}}$

ب) $\tan\left(2\pi+\frac{5\pi}{6}\right)\times\sin\left(2\pi+\frac{5\pi}{3}\right)+\cos\left(2\pi+\frac{4\pi}{3}\right)$ ۱

$\tan\frac{5\pi}{6}\times\sin\frac{5\pi}{3}+\cos\frac{4\pi}{3}=\left(-\frac{1}{\sqrt{3}}\right)\left(-\frac{\sqrt{3}}{2}\right)+\left(-\frac{1}{2}\right)=\frac{1}{2}-\frac{1}{2}=\boxed{0}$

$\frac{3\cos x-\sin x}{\cos x+\sin x}\xrightarrow{\div\sin x}\frac{3\cot x-1}{\cot x+1}=\frac{3(4)-1}{4+1}=\boxed{\frac{11}{5}}$

۲

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

$5\cos^2\alpha=1$ ۳

$\cos\alpha=-\frac{1}{\sqrt{5}}\times\frac{\sqrt{5}}{\sqrt{5}}=\boxed{\frac{-\sqrt{5}}{5}}$

الف) $\cos\left(\frac{11\pi}{4}+\alpha\right)\Rightarrow\frac{11\pi}{4}=2\pi+\frac{3\pi}{4}\longrightarrow\cos\left(\frac{3\pi}{4}+\alpha\right)$ $\sin\alpha=\frac{\sqrt{2}}{10}$

$\cos\alpha=1-\sin^2\alpha=-\frac{7\sqrt{2}}{10}$

$\cos\left(\frac{3\pi}{4}+\alpha\right)=\cos\frac{3\pi}{4}\cos\alpha-\sin\frac{3\pi}{4}\sin\alpha=\left(\frac{-\sqrt{2}}{2}\right)\left(\frac{-7\sqrt{2}}{10}\right)-\left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{2}}{10}\right)=\boxed{\frac{3}{5}}$

ب) $\tan^2\alpha+1=\frac{1}{\cos^2\alpha}\Rightarrow1+\frac{1}{14}=\frac{1}{\cos^2\alpha}=\cos\alpha=\frac{7}{\sqrt{50}}=\frac{7\sqrt{2}}{10}$ $\sin\alpha=\frac{\sqrt{2}}{10}$ ۴

$\frac{13\pi}{4}=\frac{5\pi}{4}$

$\sin\left(\frac{5\pi}{4}+\alpha\right)=\left(-\frac{\sqrt{2}}{2}\right)\cos\alpha+\left(-\frac{\sqrt{2}}{2}\right)\sin\alpha=-\frac{\sqrt{2}}{2}(\sin\alpha+\cos\alpha)=-\frac{4}{5}$

$\left(\frac{7\sqrt{2}}{10}+\frac{\sqrt{2}}{10}\right)$

$\sin^2\alpha=1-\cos^2\alpha\longrightarrow2\left(1-\cos^2\alpha\right)+\cos^2\alpha=\frac{4}{3}$

$=2-\cos^2\alpha=\frac{4}{3}$

$\cos^2\alpha=2-\frac{4}{3}=\frac{2}{3}$ $\sin^2\alpha=1-\frac{2}{3}=\frac{1}{3}$ ۵

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

$S_{ABC} = \frac{1}{2} \times 4 \times 4\sqrt{3} \times \sin\alpha = 48$ $\quad 8\sqrt{3}\sin\alpha = 24\sqrt{3}$ $\quad \sin\alpha = \frac{24\sqrt{3}}{8\sqrt{3}}$

$\frac{24\sqrt{3}}{8\sqrt{3}} = \frac{9}{4\sqrt{3}} = \frac{3}{2\sqrt{3}} = \frac{\sqrt{3}}{2} = \sin\alpha$

زاویه منفرجه $\longrightarrow 0 < a < \pi$ $\quad (180^\circ)$ $\quad \alpha = \frac{\pi}{3}\ (60^\circ)$ $\quad a = \frac{2\pi}{3}\ (120^\circ)$

$\sin\alpha = \frac{\sqrt{3}}{2}$ $\quad \sin\alpha = \frac{\sqrt{3}}{2}$

$\frac{120}{60} =$ 2 برابر

$a = 2x$ $\quad b = 3x$ $\quad S = ab\sin\alpha = (2x)(3x)\sin 60^\circ = 6x^2 \times \frac{1}{2} = 3x^2$

$3x^2 = 24$ $\quad x^2 = 18$ $\quad x \Rightarrow 3\sqrt{2}$

اضلاع: $2x = 6\sqrt{2}$ و $3x = 9\sqrt{2}$

$P = 2(6\sqrt{2} + 9\sqrt{2}) = 2(15\sqrt{2}) = 30\sqrt{2}$

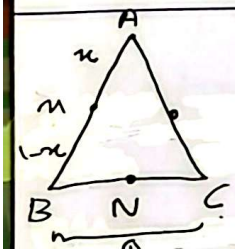
$AB = 5$ $\quad AD = 7$ $\quad AE = 4$ $\quad EC = 3$ $\quad AC = 7$ $\quad BD = 2$

$S_{ABC} = \frac{1}{2} \times 5 \times 7 \times \sin\alpha = 17.5\sin\alpha$

$S_{ADE} = \frac{1}{2} \times 7 \times 4 \times \sin\alpha = 14\sin\alpha$

$17.5\sin\alpha - 14\sin\alpha = 12.5$ $\quad 3.5\sin\alpha = 12.5$ $\quad \sin\alpha = \frac{12.5}{3.5} = \frac{1}{2}$

پس زاویه A 30° بود است



طول AB=1 فرض می کنیم (برای ساده بودن مختصات می زاریم) $A=(0,0)$ $\quad B=(1,0)$ $\quad C=(0,1)$

$S_{ABC} = \frac{1}{2} \rightarrow$ اینجا $\quad \rightarrow N = (\frac{3}{5}, \frac{2}{5})$

$\frac{BN}{NC} = \frac{2}{3} \Rightarrow \frac{BN}{BC} = \frac{2}{5}$ $\quad BN = \frac{2}{5}BC$ $\quad N$

$\frac{1}{2} = 3 \times \frac{1-x}{5}$ $\quad 1-x = \frac{5}{6}$ $\quad x = \frac{1}{6}$

مساحت $BMN = \frac{1}{2}(BM)(xN) = \frac{1}{2} \times (1-x)\times\frac{2}{5} = \frac{1-x}{5}$ $\quad BM = 1-x = \frac{5}{6}$

ارتفاع $\quad AM = x = \frac{1}{6}$

$\frac{BM}{AM} = \frac{5}{6} \times \frac{6}{1} =$ 5

ارتفاع N نسبت به AB همان x آن است

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha}$

$-\frac{1}{\cot\alpha} = -\frac{\sin\alpha}{\cos\alpha} \xrightarrow{\times\cos\alpha} |\sin\alpha| = -\sin\alpha$

$\sin\alpha < 0$ $\quad \tan\alpha > 0 \rightarrow \cos < 0$

۲ عبارت $= \begin{matrix}\sin\alpha < 0 \\ \sin\alpha > 0\end{matrix}$ $\quad |\cos\alpha| > 0$

عبارت ۲: $\frac{1}{\sqrt{\cos^2\alpha}} - \tan\alpha = \frac{1+\sin\alpha}{|\cos\alpha|}$

$\frac{1}{|\cos\alpha|} - \tan\alpha = \frac{1+\sin\alpha}{|\cos\alpha|}$

$\tan\alpha = -\frac{\sin\alpha}{|\cos\alpha|}$

$\sin\alpha < 0$ $\quad \cos < 0$ $\quad -\tan\alpha = \frac{1+\sin\alpha-1}{|\cos\alpha|}$

$\sin\alpha < 0$ $\quad$ مثبت