نام و نام خانوادگی ......[illegible]...... پاسخنامه تشریحی تکلیف شماره ..۱۸.. کلاس ....دهم [illegible] A....

۱

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

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

۲

$\frac{\cos x}{\sin x} = \frac{4}{1} \Rightarrow \begin{cases}\cos x = 4k \\ \sin x = k\end{cases} \Rightarrow \frac{3\cos x - \sin x}{\cos x + \sin x} = \frac{12k - k}{4k + k} = \frac{11}{5}$

۳

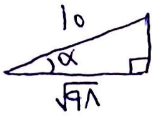
$\frac{\sin\alpha}{\cos\alpha} = 2 \Rightarrow$

$|\cos\alpha| = \frac{1}{\sqrt{5}} = \frac{\sqrt{5}}{5}$

$\xrightarrow{\alpha \text{ در ربع سوم}} \cos\alpha = -\frac{\sqrt{5}}{5}$

۴

الف)

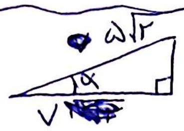


$\Rightarrow \begin{cases}\sin\alpha = \frac{\sqrt{2}}{10} \\ \cos\alpha = -\frac{\sqrt{98}}{10}\end{cases}$ (ربع دوم)

$\cos\left(\frac{11\pi}{4} + \alpha\right) = \cos\frac{11\pi}{4}\cos\alpha - \sin\frac{11\pi}{4}\sin\alpha$

$= -\frac{\sqrt{2}}{2}\times\left(-\frac{\sqrt{98}}{10}\right) - \frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{10} = \frac{7}{10} - \frac{1}{10} = \frac{6}{10} = \frac{3}{5}$

ب)



$\Rightarrow \begin{cases}\sin\alpha = \frac{1}{5\sqrt{2}} \\ \cos\alpha = \frac{7}{5\sqrt{2}}\end{cases}$

$\sin\left(\frac{13\pi}{4} + \alpha\right) = \sin\frac{13\pi}{4}\cos\alpha + \cos\frac{13\pi}{4}\sin\alpha$

$= -\frac{\sqrt{2}}{2}\times\frac{7}{5\sqrt{2}} + \left(-\frac{\sqrt{2}}{2}\right)\frac{1}{5\sqrt{2}} = \frac{-7}{10} - \frac{1}{10} = \frac{-8}{10} = \frac{-4}{5}$

۵

$\sin^2 x + (\sin^2 x + \cos^2 x) = 1 + \frac{1}{3} \Rightarrow \sin^2 x = \frac{1}{3}$

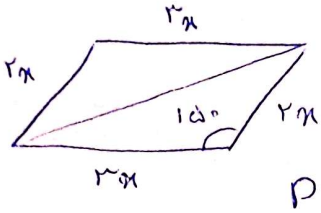
$\cos^2 x = 1 - \sin^2 x = 1 - \frac{1}{3} = \frac{2}{3}$

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

$S_{\hat{ABC}} = \frac{6 \times \sqrt{3}}{2} \times \sin\alpha = 4.5 \Rightarrow \sin\alpha = \frac{\sqrt{3}}{2} \Rightarrow \alpha = \begin{cases} 120^\circ \leftarrow Max \\ 60^\circ \leftarrow Min \end{cases}$

$\frac{Max}{Min} = \frac{120}{60} = 2$ ۶

۲ برابر



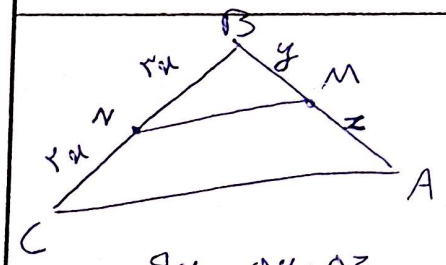
$S = \left(\frac{3x \times 2x}{2} \times \sin 150^\circ\right) \times 2 = \frac{6x^2}{2} = 3x^2$

$x^2 = 18 \Rightarrow x \cdot \sqrt{18} \Rightarrow x = 3\sqrt{2}$ ۷

$P = 10x = 30\sqrt{2}$

$S_{\hat{ABC}} - S_{ADE} = 1.75 \Rightarrow \frac{5 \times 7}{2} \sin\hat{A} - \frac{3 \times 7}{2} \sin\hat{A} = \frac{7}{4} \Rightarrow \sin\hat{A} = \frac{1}{2}$

$\Rightarrow \hat{A} = \begin{cases} 30^\circ \\ 150^\circ \text{ قابل قبول نیست} \end{cases} \Rightarrow \tan\hat{A} = \frac{\sqrt{3}}{3}$ ← پاسخ ۸



$\frac{S_{\hat{ABC}}}{S_{\hat{BMN}}} = \frac{\frac{5x(y+z)}{2} \sin\hat{B}}{\frac{3x \cdot y}{2} \sin\hat{B}} = 3$ ۹

$9y = 5y + 5z \Rightarrow \frac{BM}{AM} = \frac{y}{z} = \frac{5}{4}$

$4y = 5z$

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \Rightarrow \sin\alpha < 0$ *

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

$= \frac{1}{|\cos\alpha|}\left(+\frac{\sin\alpha}{|\cos\alpha|}\right) = \frac{1}{|\cos\alpha|}\left(-\frac{\sin\alpha}{\cos\alpha}\right) \Rightarrow \cos\alpha < 0$ ☆ ۱۰

☆ و * ⟹ انتهای کمان α در ربع ۳ قرار دارد

(ناحیه ۳)