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نام و نام خانوادگی: ..... پاسخنامه تشریحی تکلیف شماره ۱۱ کلاس دهم دختران

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الف) $\tan\frac{11\pi}{4}+\sin\frac{15\pi}{4}\cos\frac{13\pi}{4}=\tan\left(3\pi-\frac{\pi}{4}\right)+\sin\left(4\pi-\frac{\pi}{4}\right)\cos\left(3\pi+\frac{\pi}{4}\right)$

$=-\tan\frac{\pi}{4}+\left(-\sin\frac{\pi}{4}\right)\left(-\cos\frac{\pi}{4}\right)=-1+\frac{1}{2}=\frac{-1}{2}$

ب) $\tan\frac{17\pi}{6}\sin\frac{11\pi}{3}+\cos\frac{10\pi}{3}=\tan\left(3\pi-\frac{\pi}{6}\right)\sin\left(4\pi-\frac{\pi}{3}\right)+\cos\left(3\pi+\frac{\pi}{3}\right)$

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

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$\frac{3\cos\alpha-\sin\alpha}{\cos\alpha+\sin\alpha}=\frac{12\sin\alpha-\sin\alpha}{4\sin\alpha+\sin\alpha}=\frac{11\sin\alpha}{5\sin\alpha}=\frac{11}{5}=2/2$

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

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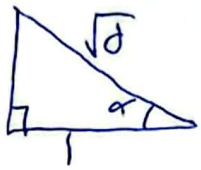
$\sin\alpha=2\cos\alpha\rightarrow\tan\alpha=\frac{\sin\alpha}{\cos\alpha}=2$

$\frac{\pi}{2}<\alpha<\pi\rightarrow\cos\alpha<0\quad\sin\alpha>0$

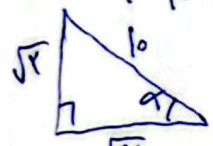


$\cos\alpha=\frac{-1}{\sqrt{5}}=\frac{-\sqrt{5}}{5}$

۴

الف) $\cos\left(\frac{11\pi}{4}+\alpha\right)=\cos\frac{11\pi}{4}\cos\alpha-\sin\frac{11\pi}{4}\sin\alpha=\frac{-\sqrt{2}}{2}\times\frac{-\sqrt{91}}{10}-\left(\frac{\sqrt{2}}{2}\right)\times\frac{\sqrt{9}}{10}=\frac{6}{10}=\frac{3}{5}$

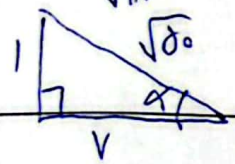
$\frac{11\pi}{4}=2\pi+\frac{3\pi}{4}$ ، $\cos\alpha<0$



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

$-\frac{\sqrt{2}}{2}\times\frac{7}{\sqrt{50}}+\frac{1}{\sqrt{50}}\times\frac{-\sqrt{2}}{2}=\frac{-7}{10}+\left(\frac{-1}{10}\right)=\frac{-8}{10}=\frac{-4}{5}$

$\frac{13\pi}{4}=3\pi+\frac{\pi}{4}$



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$\left.\begin{aligned}2\sin^2\alpha+\cos^2\alpha&=\frac{4}{3}\\ \sin^2\alpha+\cos^2\alpha&=1\end{aligned}\right\}\Rightarrow\sin^2\alpha=\frac{1}{3}\quad\cos^2\alpha=1-\frac{1}{3}=\frac{2}{3}$

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

۶

$S = \frac{۱}{۲} ab\sin\alpha = \frac{۱}{۲}\times ۶\times\sqrt{۳}\times \sin\alpha = ۴/۵$

$\sin\alpha = \frac{۴/۵}{۳\sqrt{۳}} = \frac{۱/۵}{\sqrt{۳}} = \frac{۱/۵\sqrt{۳}}{۳} = \frac{\sqrt{۳}}{۲}$

$\frac{\max\alpha}{\min\alpha} = \frac{۱۲۰^\circ}{۶۰^\circ} = ۲$

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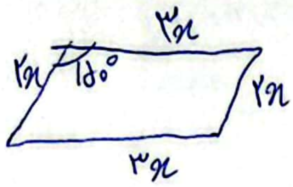

$S = ۵۴ = ab\sin\alpha = ۲x\times ۳x\times \sin ۱۵۰^\circ = ۶x^۲\times\frac{۱}{۲} = ۳x^۲$

$x^۲ = ۱۸ \quad x = \sqrt{۱۸} = ۳\sqrt{۲}$

$۲P = ۱۰x = ۱۰\times ۳\sqrt{۲} = ۳۰\sqrt{۲}$

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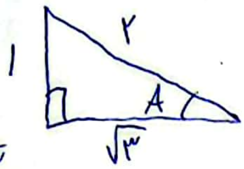
$S_{ABC} - S_{ADE} = ۱/۷۵ = \frac{۱}{۲}\sin A\,(\underbrace{۵\times ۷}_{۳۵} - \underbrace{۷\times ۴}_{۲۸}) = ۱/۷۵$ ۷

$\sin A = \frac{۱}{۲}$



$\tan A = \frac{۱}{\sqrt{۳}} = \frac{\sqrt{۳}}{۳}$

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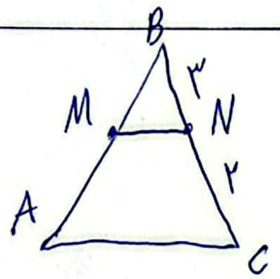

$\frac{BN}{NC} = \frac{۳}{۲} = ۱/۵ \qquad \frac{BC}{BN} = \frac{۵}{۳}$

$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{۱}{۲}\times AB\times BC\times \sin B}{\frac{۱}{۲}\times BM\times BN\times \sin B} = ۳$

$\frac{AB}{BM} = \frac{۹}{۵} \Rightarrow \frac{AM}{BM} = \frac{۴}{۵} \Rightarrow \frac{BM}{AM} = \frac{۵}{۴}$

۱۰

$\frac{۱}{\sqrt{\cos^۲\alpha}} - \tan\alpha = \frac{۱+\sin\alpha}{|\cos\alpha|} \qquad \frac{|\sin\alpha|}{\cos\alpha} = -\frac{۱}{\cot\alpha} \Rightarrow \frac{|\sin\alpha|}{\cos\alpha} = \frac{-\sin\alpha}{\cos\alpha}$

$\Rightarrow \sin\alpha < ۰$ ①

$\hookrightarrow \frac{۱}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{۱+\sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha < ۰$ ②

①② $\Rightarrow$ ناحیه سوم قرار دارد