۲۰ عالی

Year. Month. Date. ( )

دهم رشته B

الیا یادگاری

۱) الف) $\tan\left(۳\pi-\frac{\pi}{۴}\right)+\sin\left(۴\pi-\frac{\pi}{۴}\right)\cos\left(۳\pi+\frac{\pi}{۴}\right)\rightarrow$

$-\tan\left(\frac{\pi}{۴}\right)+\left(-\sin\frac{\pi}{۴}\right)\times-\cos\left(\frac{\pi}{۴}\right)=-۱+\frac{۱}{۲}=\frac{-۱}{۲}$

ب) $\tan\left(۳\pi-\frac{\pi}{۴}\right)\times\sin\left(۴\pi-\frac{\pi}{۳}\right)+\cos\left(۳\pi+\frac{\pi}{۳}\right)\rightarrow\left(\underbrace{-\tan\left(\frac{\pi}{۴}\right)}_{-\frac{\sqrt{۳}}{۳}}\times\underbrace{-\sin\left(\frac{\pi}{۳}\right)}_{-\frac{\sqrt{۳}}{۲}}\right)-\cos\left(\frac{\pi}{۳}\right)$

$\frac{۱}{۲}-\frac{۱}{۲}=۰$

۲) صورت و مخرج را بر $\sin\alpha$ تقسیم کنیم.

$\frac{۳\cot\alpha-۱}{\cot\alpha+۱}=\frac{۳(۴)-۱}{۴+۱}=\frac{۱۱}{۵}$

۳) $\sin^۲\alpha+\cos^۲\alpha=۱\rightarrow(۲\cos\alpha)^۲+\cos^۲\alpha=۱\rightarrow۴\cos^۲\alpha+\cos^۲\alpha=۱$

$۵\cos^۲\alpha=۱\rightarrow\cos^۲\alpha=\frac{۱}{۵}\rightarrow\cos\alpha\begin{cases}+\frac{\sqrt{۵}}{۵}\\-\frac{\sqrt{۵}}{۵}\end{cases}$ غیق

$\cos\alpha=-\frac{\sqrt{۵}}{۵}$

۴) الف) $\cos\left(۲\pi+\frac{۳\pi}{۲}+\alpha\right)=\cos\left(\frac{۳\pi}{۲}+\alpha\right)\rightarrow\cos\frac{۳\pi}{۲}\cos\alpha-\underbrace{\sin\frac{۳\pi}{۲}}_{-۱}\times\sin\alpha=$

$\cos\alpha=-\sqrt{۱-\sin^۲\alpha}\rightarrow\cos\alpha=-\sqrt{۱-\frac{۱}{۵۰}}=-\frac{۷}{۵\sqrt{۲}}$

$\frac{\sqrt{۲}}{۲}\left(-\frac{\sqrt{۲}}{۲}\times\frac{-۷}{۵\sqrt{۲}}\right)-\frac{\sqrt{۲}}{۲}\times\frac{\sqrt{۲}}{۱۰}$

$\frac{۷}{۱۰}-\frac{۱}{۱۰}=\frac{۶}{۱۰}=\frac{۳}{۵}$

ب) $\sin\left(۲\pi+\frac{۵\pi}{۴}+\alpha\right)=\sin\left(\frac{۵\pi}{۴}+\alpha\right)\rightarrow\sin\frac{۵\pi}{۴}\times\cos\alpha+\sin\alpha\cdot\cos\frac{۵\pi}{۴}$

$-\frac{\sqrt{۲}}{۲}\times\frac{۷}{۵\sqrt{۲}}+\frac{۱}{۵\sqrt{۲}}\times-\frac{\sqrt{۲}}{۲}=\frac{-۸}{۱۰}=-\frac{۴}{۵}$

$۱+\tan^۲=\frac{۱}{\cos^۲}$ $\cos\alpha=\frac{۷}{۵\sqrt{۲}}$

$\sin=\frac{۱}{۵\sqrt{۲}}$ $\cos^۲\alpha+\sin^۲\alpha=۱$

۵) $\sin^۲\alpha=۱-\cos^۲\alpha$ $۲(۱-\cos^۲\alpha)+\cos^۲\alpha=\frac{۴}{۳}\rightarrow\cos^۲\alpha=\frac{۲}{۳}$

$۱+\tan^۲\alpha=\frac{۱}{\cos^۲\alpha}\rightarrow۱+\tan^۲\alpha=\frac{۳}{۲}\rightarrow\tan^۲\alpha=\frac{۱}{۲}$

۶) $S_{\text{مثلث}}=\frac{۱}{۲}\times۶\times\sqrt{۲}\times\sin\alpha=۴\sqrt{۵}\rightarrow۳\sqrt{۲}\sin\alpha=۴\sqrt{۵}\rightarrow\sin\alpha=\frac{۴\sqrt{۵}}{۳\sqrt{۲}}=\frac{۴\sqrt{۱۰}}{۶}$

$\sin\alpha=\frac{\sqrt{۳}}{۲}\rightarrow\alpha\begin{cases}۶۰\\۱۲۰\end{cases}$ $\frac{۱۲۰}{۶۰}=۲$

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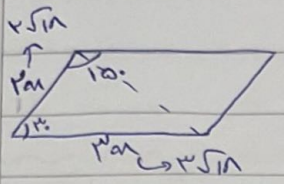


$\left(\frac{1}{2} \times 3a \times 2a \times \sin 30^\circ\right) \times 2 = 54 \qquad 6a^2 \times \frac{1}{2} = 54$ (۷

$3a^2 = 54 \rightarrow a^2 = 18 \rightarrow a = \pm\sqrt{18}$ ✓

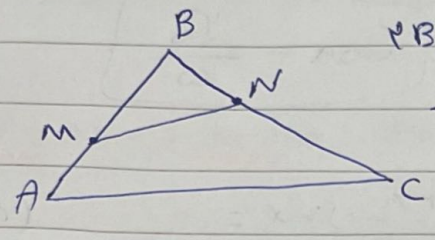
$P = (3\sqrt{18} + 2\sqrt{18}) \times 2 = 10\sqrt{18}$ ✓

$S_{ABC} = \underbrace{\frac{1}{2} \times 5 \times 7 \times \sin A}_{\frac{35}{2}\sin A} \qquad S_{ADE} = \underbrace{\frac{1}{2} \times 7 \times 4 \times \sin A}_{14\sin A}$ (۸

$17,5\sin A - 14\sin A = 1,75 \rightarrow 3,5\sin A = 1,75 \rightarrow \sin A = 0,5 = \frac{1}{2}$ چون A حاده است

$A = 30^\circ$

$\tan A = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$



$2BN = 3NC \rightarrow BN = \frac{3}{2}NC$ (۹

$\frac{3}{2}NC + NC = \frac{5}{2}NC$

$S_{ABC} = \frac{1}{2} \times \frac{5}{2}NC \times AB \times \sin B = \underbrace{3 \times \left(\frac{1}{2} \times \frac{3}{2}NC \times MB \times \sin\right.}_{S_{BMN}}$

$\frac{5}{4}\cancel{NC} \times AB \times \cancel{\sin B} = \frac{9}{4}\cancel{NC} \times MB \times \cancel{\sin B}$

$AB = (BM + AM)$

$\frac{5}{4}BM + \frac{5}{4}AM = \frac{9}{4}MB \rightarrow \frac{5}{4}AM = MB$

$\frac{BM}{AM} = \frac{5}{4}$ ✓

$\frac{|\sin\alpha|}{\cos\alpha} = \frac{-1}{\cot\alpha} \rightarrow \frac{|\sin\alpha|}{\cos\alpha} = \frac{-\sin\alpha}{\cos\alpha} \rightarrow \sin\alpha < 0$ (۱۰

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

$\cos > 0 \rightarrow \tan\alpha = -\tan\alpha$

$\cos < 0 \rightarrow \tan\alpha = \tan\alpha$ ✓

$\cos\alpha < 0 \ , \ \sin\alpha < 0 \rightarrow$ ناحیه سوم ✓