یسنا قرامانی پنجشنبه عطار C

①

الف) $\tan\frac{11\pi}{4} + \sin\frac{15\pi}{4}\cos\frac{13\pi}{4}$

$$\begin{array}{r|l} 11 & 4 \\ -8 & 2 \\ \hline 3 & \end{array}$$

$\tan(2\pi+\frac{3\pi}{4}) + \sin(3\pi+\frac{3\pi}{4})\cos(3\pi+\frac{\pi}{4})$

$$\begin{array}{r|l} 15 & 4 \\ -12 & 3 \\ \hline 3 & \end{array}$$

$\tan(\frac{3\pi}{4}) + \sin(\frac{3\pi}{4})\cos(\frac{\pi}{4})$

$-1 + \frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{2} = -1+\frac{1}{2} = \boxed{-\frac{1}{2}}$

$$\begin{array}{r|l} 13 & 4 \\ -12 & 3 \\ \hline 1 & \end{array}$$

ب) $\tan\frac{17\pi}{6}\sin\frac{11\pi}{3} + \cos\frac{10\pi}{3}$

$$\begin{array}{r|l} 17 & 6 \\ -12 & 2 \\ \hline 5 & \end{array}$$

$\tan(2\pi+\frac{5\pi}{6})\sin(3\pi+\frac{2\pi}{3}) + \cos(3\pi+\frac{\pi}{3})$

$$\begin{array}{r|l} 11 & 3 \\ -9 & 3 \\ \hline 2 & \end{array}$$

$\tan(\frac{5\pi}{6})\sin(\frac{2\pi}{3}) + \cos(\frac{\pi}{3})$

$$\begin{array}{r|l} 10 & 3 \\ -9 & 3 \\ \hline 1 & \end{array}$$

$\underbrace{-\frac{\sqrt{3}}{3}\times\frac{\sqrt{3}}{3}}_{-\frac{1}{2}} + \frac{1}{2} = \boxed{0}$

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②

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

$\cot = \frac{\cos}{\sin} = 4 \rightarrow \begin{cases} \sin\rightarrow 1 \\ \cos\rightarrow 4 \end{cases}$

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$\sin = 2\cos \xrightarrow{\text{۳ن}} \cos \cdot \sin < 0$

$\sin^2 + \cos^2 = 1 \rightarrow 4\cos^2 + \cos^2 = 5\cos^2 = 1$

$\cos^2 = \frac{1}{5}$

$\cos = \underset{\text{۳ن}}{\pm} \frac{1}{\sqrt{5}} \rightarrow \boxed{-\frac{\sqrt{5}}{5}}$

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الف)

$\cos\left(\frac{11\pi}{4} - \alpha\right) \rightarrow \overset{\cos(2\pi + \frac{3\pi}{4})}{\cancel{\cos\frac{11\pi}{4}}} \cos\alpha - \overset{\sin(2\pi + \frac{3\pi}{4})}{\cancel{\sin\frac{11\pi}{4}}} \sin\alpha$

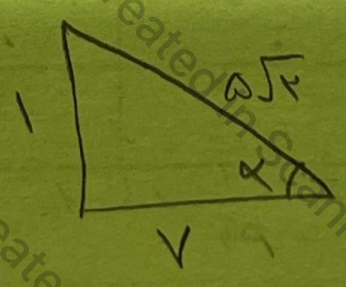
$\sin\alpha = \frac{\sqrt{2}}{10}$

$\cos^2\alpha = 1 - \sin^2 = 1 - \frac{2}{100} = \frac{98}{100} \rightarrow \cos\alpha = \frac{\overset{2\times 49}{\sqrt{98}}}{10} = \underset{\text{۲ن}}{\pm} \frac{7\sqrt{2}}{10}$

$\Rightarrow -\frac{\sqrt{2}}{2} \times -\frac{7\sqrt{2}}{10} - \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{10} = \boxed{\frac{3}{5}}$

ب) $\sin\left(\frac{13\pi}{4} + \alpha\right) \rightarrow \underset{\sin(3\pi + \frac{\pi}{4})}{\cancel{\sin\frac{13\pi}{4}}} \cos\alpha + \sin\alpha \underset{\sin(3\pi + \frac{\pi}{4})}{\cancel{\cos\frac{13\pi}{4}}}$

$\tan = \frac{1}{7}$



$\sqrt{1+49} = \sqrt{\overset{2\times 25}{50}} = 5\sqrt{2}$

$\sin\alpha = \frac{1}{5\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{10}$

$\cos\alpha = \frac{7}{5\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{7\sqrt{2}}{10}$

$\Rightarrow \frac{\sqrt{2}}{2} \times \frac{7\sqrt{2}}{10} + \frac{\sqrt{2}}{10} \times \frac{\sqrt{2}}{2} = \frac{-4}{5}$

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$2\sin^2 + \cos^2 = \frac{4}{3}$

$\sin^2 + \underbrace{\sin^2 + \cos^2}_{1} = \frac{4}{3} \rightarrow \sin^2 = \frac{4-3}{3} = \frac{1}{3}$

$\rightarrow \frac{2}{3} + \cos^2 = \frac{4}{3} \rightarrow \cos^2 = \frac{2}{3}$ $\quad \tan^2 = \frac{\frac{1}{3}}{\frac{2}{3}} = \boxed{\frac{1}{2}}$

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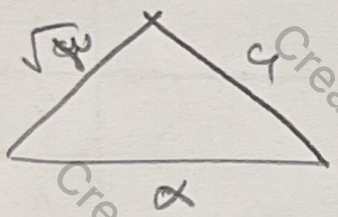
$S = \frac{1}{2} \times 6 \times \sqrt{3} \times \sin x = 4.5$



روبه‌روی α

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

کمترین $\alpha = 60 \quad \frac{\pi}{3}$

بیشترین $\alpha = 120 \quad \frac{2\pi}{3}$

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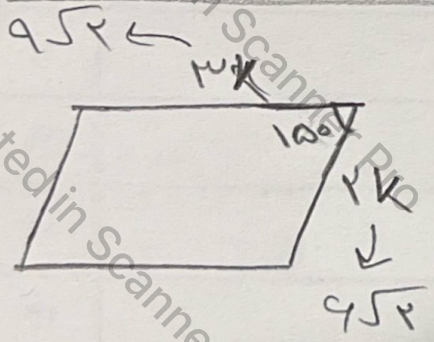

$S = 3k \times 2k \times \overset{\frac{1}{2}}{\cancel{\sin 150}} = 54$

$3k^2 = 54$

$k^2 = 18$

$k = 3\sqrt{2}$

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

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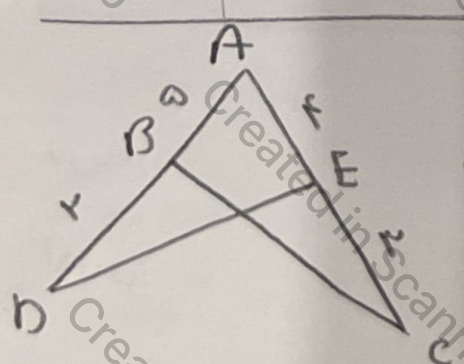

$S_{ADE} = \frac{1}{2} \times 7 \times 4 \times \sin A = 4k$

$S_{ABC} = \frac{1}{2} \times 7 \times 5 \times \sin A = 5k$

$5k - 4k = k = 1.75$

$\frac{1}{\cancel{2}} \times \cancel{7} \times \cancel{4}^{2} \times \sin A = \cancel{7}$

$2\sin A = 1$

$\sin A = \frac{1}{2}$

$\cos A = \frac{\sqrt{3}}{2}$

$\tan A = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{\sqrt{3}}{3}$

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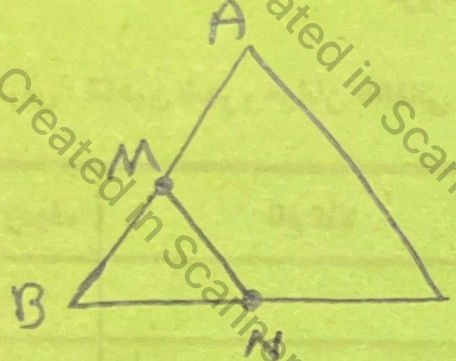


$۲BN = ۲NC \rightarrow BN = \frac{۲}{۲}NC$

$S_{ABC} = ۲^{۲} S_{BMN}$

$\frac{۱}{۲} \times AB \times BC \times \sin B = \frac{۲}{۲} \times BM \times BN \times \sin B$

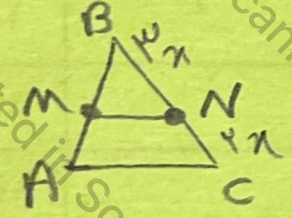
$BC = BN + NC \rightarrow BC = BN + \frac{۲}{۲}BN = \frac{۳}{۲}BN$

$AB = AM + BM \rightarrow \frac{۹}{۵}BN = BM = AM \rightarrow AM = \frac{۴}{۳}BM$

$\frac{BM}{AM} = \frac{۳}{۴}$

$AB \times ۵M \times \frac{۱}{۲} \times \sin B = ۲(\frac{۲}{۲} \times \sin \times ۲n \times BM)$

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



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$\frac{۱}{\sqrt{\cos^{۲}}} - \tan = \frac{۱+\sin}{|\cos|} \rightarrow \frac{۱}{|\cos|} - \frac{۱+\sin}{|\cos|} = \frac{\sin}{\cos}$

$\frac{|\cos|}{\cos}$

$\frac{۱+۲-\sin}{|\cos|} = \frac{\sin}{\cos}$

$\frac{|\sin|}{\cos\alpha} = -\frac{\sin}{\cos} \rightarrow |\sin| = -\sin \rightarrow \sin < ۰$

$-|\cos| = \cos$

$\cos < ۰$

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