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زهراسادات حسینی

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(۱)

الف) $\tan\frac{11\pi}{4} + \sin\frac{15\pi}{4} \times \cos\frac{13\pi}{4} = \tan\frac{3\pi}{4} + \sin\frac{7\pi}{4} \times \cos\frac{5\pi}{4} =$

$\tan(135^\circ) + (\sin(315^\circ) \times \cos(225^\circ)) = -1 + \left(-\frac{\sqrt{2}}{2} \times -\frac{\sqrt{2}}{2}\right) =$

$-\frac{1}{2}$

ب) $\tan\frac{17\pi}{6} \sin\frac{11\pi}{3} + \cos\frac{10\pi}{3} = \tan\frac{5\pi}{6} \times \sin\frac{5\pi}{3} + \cos\frac{4\pi}{3}$

$(\tan(150^\circ) \times \sin(300^\circ)) + \cos(240^\circ) = \frac{3}{6} - \frac{1}{2} = \frac{1}{2} - \frac{1}{2} = 0$

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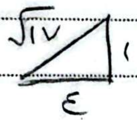
$\cot a = 4 \rightarrow$ مجاور / مقابل



$\frac{3\cos x - \sin x}{\cos x + \sin x} =$

$\cos = \frac{4}{\sqrt{17}}$

$\frac{3 \times \frac{4}{\sqrt{17}} - \frac{1}{\sqrt{17}}}{\frac{4}{\sqrt{17}} + \frac{1}{\sqrt{17}}} = \frac{\frac{11}{\sqrt{17}}}{\frac{5}{\sqrt{17}}} = \frac{11}{5}$

$\sin = \frac{1}{\sqrt{17}}$

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$\sin\alpha = 2\cos\alpha$

$\sin^2 + \cos^2 = 1$

$4\cos^2 + \cos^2 = 1$

$\cos\alpha$ (−) ، $\sin\alpha$ (−)

$5\cos^2 = 1$

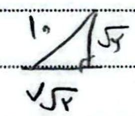
$\cos^2 = \frac{1}{5} \rightarrow \cos\alpha = \; \nearrow +\frac{1}{\sqrt{5}}$ غلط چون در ناحیه سوم

$\searrow -\frac{1}{\sqrt{5}}$ ✓

(۴) الف)

$\sin$ (+) ، $\cos$ (−)

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



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

$\left(-\frac{\sqrt{2}}{2} \times -\frac{7\sqrt{2}}{10}\right) - \left(\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{10}\right) = \frac{14}{20} - \frac{2}{20} = \frac{3}{5}$

ب)

$\sin$ (−) ، $\cos$ (+)

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

$\sin\left(\frac{13\pi}{4} + \alpha\right) = \sin\left(\frac{5\pi}{4} + \alpha\right) = \sin\left(\frac{5\pi}{4}\right)\cos\alpha + \sin\alpha\cos\left(\frac{5\pi}{4}\right) \rightarrow$

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

Arman

زهرا سادات حسینی

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$2\sin^2 x+\cos^2 x=\frac{4}{3} \to 2\sin^2 x+(1-\sin^2 x)=\frac{4}{3} \to \sin^2 x+1=\frac{4}{3} \to$

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

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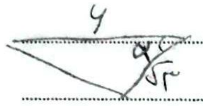

$S_\triangle=\frac{1}{2}\times 6\times\sqrt{3}\times\sin\alpha = 4.5 \to 3\sqrt{3}\sin\alpha=\frac{9}{2}$

$\sin\alpha=\frac{\sqrt{3}}{2} \to$ ۶۰° یا α = ۱۲۰° $\quad \frac{120}{60}=\boxed{2}$ $\qquad \boxed{\sin\alpha=\frac{3}{2\sqrt{3}}}=\frac{\sqrt{3}}{2}$

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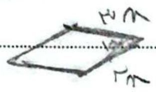
$S=54 \to S=3x\times 2x\times\sin(150°)\times 2\times\frac{1}{2} \Rightarrow 6x^2\times\frac{1}{2}=54$



$x^2=18 \to x=\sqrt{18}$

محیط $= 2\left((3\times\sqrt{18})+(2\times\sqrt{18})\right)=\boxed{30\sqrt{2}}$

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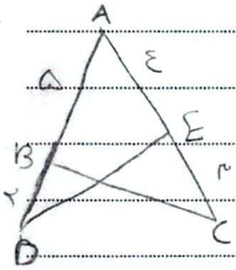
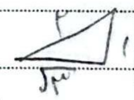


$S_{ABC}-S_{ADE}=1.5 \to$

$\left(\frac{1}{2}\times 7\times 5\times\sin A\right)-\left(\frac{1}{2}\times 7\times 4\times\sin A\right)\to$

$\frac{7}{2}\times\sin A(5-4)=\frac{7}{4} \to \sin A=\frac{1}{2}$

$\boxed{1.5=\frac{7}{4}}$ $\qquad \cos A=\frac{\sqrt{3}}{2}$ $\quad \boxed{\tan=\frac{1}{\sqrt{3}}}$



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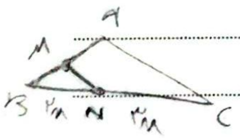

$S_{ABC}=3S_{BMN}$

$\frac{S_{ABC}}{S_{BMN}}=\frac{\frac{1}{2}\times AB\times 5x\times\sin B}{\frac{1}{2}\times BM\times 2x\times\sin B}=3 \Rightarrow \frac{AB}{BM}=\frac{5}{9}$

$\frac{BM}{BM+AM}=\frac{5}{9} \to BM=5x, \; AM=4x \Big\} \boxed{\frac{BM}{AM}=\frac{5}{4}}$

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

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

cos منفی بوده که کسر هم منفی شده

$$\frac{\sin\alpha}{\cos\alpha} = \frac{-\sin\alpha}{|\cos\alpha|} \rightarrow \boxed{\cos\alpha < 0}$$

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

مخرج کسر ها برابر

ناصیه سوم.