سروش اخوان   تکلیف ۱۸   دهم پسر B   **۱۹**

Subject:
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۱- الف) $\tan 225^\circ + \sin 315^\circ . \cos 225^\circ = (-1) + \left(-\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2}\right) = -\frac{1}{2}$ ✓ ; $\frac{1}{2}$

(۲)

ب) $\tan 150^\circ . \sin 300^\circ + \cos 240^\circ = -\frac{1}{\sqrt{3}} . \left(-\frac{\sqrt{3}}{2}\right) + \left(-\frac{1}{2}\right) = 0$ ✓ ; $\frac{1}{2}$

۲- $\cot x = 4 \left\{ \frac{3\cos x - \sin x}{\cos x + \sin x} \xrightarrow{\div \sin x} \frac{3\cot x - 1}{\cot x + 1} = \frac{12-1}{4+1} = \frac{11}{5} \right.$ ✓ (۲)

۳- $\sin\alpha = 2\cos\alpha \Rightarrow \sqrt{1-\cos^2\alpha} = 2\cos\alpha \Rightarrow 1-\cos^2\alpha = 4\cos^2\alpha$

$\Rightarrow 1 = 5\cos^2\alpha \Rightarrow \cos^2\alpha = \frac{1}{5} \Rightarrow \cos\alpha = \pm\frac{\sqrt{5}}{5} \Rightarrow -\frac{\sqrt{5}}{5}$ ✓ (۲)

(+) غیرقابل قبول چون ربع سوم است

۴- الف)

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

$\sin\alpha = \frac{\sqrt{2}}{10} \Rightarrow \sqrt{1-\cos^2\alpha} = \frac{\sqrt{2}}{10} \Rightarrow 1-\cos^2\alpha = \frac{1}{50}$

$\cos^2\alpha = \frac{49}{50} \Rightarrow \cos\alpha = \pm\frac{7}{\sqrt{50}} \xrightarrow{\text{ربع دوم است}} -\frac{7}{\sqrt{50}}$

$\left(-\frac{\sqrt{2}}{2} . \frac{-7}{5\sqrt{2}}\right) - \left(\frac{\sqrt{2}}{2} . \frac{\sqrt{2}}{10}\right) = 0/6$ ✓ ; $\frac{7}{10}$; $\frac{1}{10}$ (۲)

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

$\frac{1}{\cos^2\alpha} = 1 + \frac{1}{49} \Rightarrow \frac{1}{\cos^2\alpha} = \frac{50}{49} \Rightarrow \cos^2\alpha = \frac{49}{50}$

$\Rightarrow \cos\alpha = \pm\frac{7}{\sqrt{50}} \xrightarrow{\text{در ربع اول است}} \cos\alpha = \frac{7}{\sqrt{50}} = \frac{7}{5\sqrt{2}} , \sin\alpha = \frac{1}{\sqrt{50}} = \frac{1}{5\sqrt{2}}$

$\left(-\frac{\sqrt{2}}{2} . \frac{7}{5\sqrt{2}}\right) + \left(-\frac{\sqrt{2}}{2} . \frac{1}{5\sqrt{2}}\right) = -0/8$ ✓ ; $-\frac{7}{10}$; $-\frac{1}{10}$

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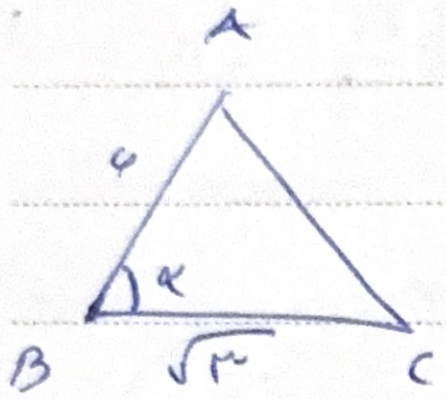
$۲\sin^۲x + (1-\sin^۲x)^{\frac{۱}{۲}} = \frac{۶}{۲} \Rightarrow ۲\sin^۲x + 1 - \sin^۲x = \frac{۶}{۲} \Rightarrow \sin^۲x = \frac{۱}{۲}$ — ۵

$\Rightarrow \cos^۲x = \frac{۲}{۳}$ ($\sin^۲x + \cos^۲x = 1$ رابطه) $\Rightarrow \tan^۲x = \frac{\frac{۱}{۲}}{\frac{۲}{۳}} = \frac{۱}{۲}$ ✓ (۲)



$\frac{۱}{۲} \times ۶ \times \sqrt{۳} \times \sin\alpha = ۶\sqrt{۳}$ — ۶

$\Rightarrow \sqrt{۳} \times \sin\alpha = ۱,۷ \Rightarrow \sin\alpha = \frac{۱,۷\sqrt{۳}}{\sqrt{۳}\cdot\sqrt{۳}} = \frac{۱,۷\sqrt{۳}}{۳}$

$= \frac{۳\sqrt{۳}}{۹} = \frac{\sqrt{۳}}{۳} \Rightarrow \alpha = ۶۰^\circ, ۱۲۰^\circ$ $\frac{۱۲۰}{۶۰} = ۲$ ✓ (۲)

$a \times b \times \sin ۱۲۰^\circ = ۶۴ \Rightarrow a.b \cdot \frac{۱}{۲} = ۶۴ \Rightarrow a.b = ۱۰۸$ — ۷

$\frac{a}{b} = \frac{۲}{۳} \Rightarrow b = \frac{۳a}{۲}$ (۲)

$\Rightarrow \frac{۳a}{۲} a = ۱۰۸ \Rightarrow \frac{۳a^۲}{۲} = ۱۰۸ \Rightarrow ۳a^۲ = ۲۱۶ \Rightarrow a^۲ = ۷۲ \Rightarrow a = ۶\sqrt{۲}$

$\Rightarrow a = ۹\sqrt{۲}$ $\quad ۲(۹\sqrt{۲} + ۴\sqrt{۲}) = ۲۶\sqrt{۲}$ ✓ $\rightarrow$ محیط

$S_{ABC} - S_{ADE} = ۱,۷۵ \Rightarrow \frac{۱}{۲}.۶.۷.\sin\hat{A} - \frac{۱}{۲}.۷.۴.\sin\hat{A} = ۱,۷۵$ — ۸

$\frac{۲۰}{۲}\sin\hat{A} - ۱۴\sin\hat{A} = ۱,۷۶ \Rightarrow ۶,۶\sin\hat{A} = ۱,۷۶$

$\Rightarrow ۲\sin\hat{A} = ۱ \Rightarrow \sin\hat{A} = \frac{۱}{۲}$

$\cos\hat{A} = \sqrt{۱-\sin^۲\hat{A}} = \sqrt{۱-\frac{۱}{۴}} = \sqrt{\frac{۳}{۴}} = \frac{\sqrt{۳}}{۲}$ (۲)

$\tan\hat{A} = \frac{\frac{۱}{۲}}{\frac{\sqrt{۳}}{۲}} = \frac{۱}{\sqrt{۳}} = \frac{\sqrt{۳}}{۳}$ ✓

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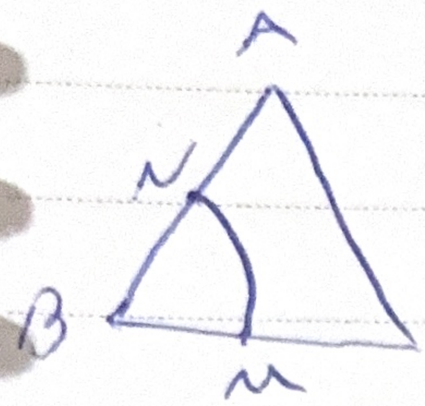

$2\overline{BN} = 3\overline{NC} \Rightarrow NC = \frac{2}{3}BN$ ـ۹

$\frac{1}{2} \cdot AB \cdot BC \cdot \sin\hat{B} = 3 \cdot \frac{1}{2} \cdot BM \cdot BN \cdot \sin\hat{B}$ (۲)

$\Rightarrow (BM + AM)(BN + NC) = 2 \cdot BM \cdot BN$

$\Rightarrow (BM + AM)(\frac{5}{3}BN) = 3 \times BM \cdot BN$

$\Rightarrow \frac{5}{3}(BM + AM) = 3BM \Rightarrow \frac{5}{3}BM + \frac{5}{3}AM = 3BM$

$\Rightarrow \frac{5}{3}AM = \frac{4}{3}BM \Rightarrow 5AM = 4BM \Rightarrow \frac{BM}{AM} = \frac{5}{4}$ ✓

(۱) گزینه ۱.

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

$$\frac{1}{|\cos\alpha|} - \frac{1+\sin\alpha}{|\cos\alpha|} = \frac{\sin\alpha}{\cos\alpha} \rightarrow \frac{-\sin\alpha}{|\cos\alpha|} = \frac{\sin\alpha}{\cos\alpha} \rightarrow \cos\alpha < 0 \quad (I)$$

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

(I) , (II) → ناحیه سوم