دهم ریاضی A - تکلیف ۱۸ — ۱۵

«به نام خدا» — اسماعیل میرزائی

سوال ۱ ← (۱٫۷۵)

الف) $\tan \frac{11\pi}{4} + \sin \frac{10\pi}{4} \cos \frac{13\pi}{4}$

$\tan\left(2\pi + \frac{3\pi}{4}\right) + \sin\left(2\pi + \frac{2\pi}{4}\right) \times \cos\left(3\pi + \frac{\pi}{4}\right) = -1 + \left(\frac{\sqrt{2}}{2} \times -\frac{\sqrt{2}}{2}\right) = -\frac{1}{2}$ ✓

ب) $\tan \frac{17\pi}{6} \sin \frac{11\pi}{3} + \cos \frac{10\pi}{3} = \left(-\frac{\sqrt{3}}{3} \times -\frac{\sqrt{3}}{2}\right) - \frac{1}{2}$

$= \frac{3}{6} - \frac{1}{2} = 0$

سوال ۲ ← (۲)

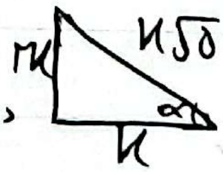
$\cot x = 4 \rightarrow \frac{\cos x}{\sin x} = 4 \rightarrow 4\sin x = \cos x$

$\rightarrow \cos x = 4y \,,\ \sin x = y$

$\frac{3\cos x - \sin x}{\cos x + \sin x} = \frac{3(4y) - y}{4y + y} = \frac{11y}{5y} = \frac{11}{5} = 2.2$ ✓

سوال ۳ ← (۲)

$\sin\alpha = 2\cos\alpha \rightarrow \tan\alpha = 2 \rightarrow$



$\rightarrow \cos\alpha = \frac{x}{x\sqrt{5}} = \frac{1}{\sqrt{5}} \xrightarrow{\text{در ناحیه ۳}} -\frac{1}{\sqrt{5}} = -\frac{\sqrt{5}}{5}$ ✓

الف) $\cos(2\pi + \frac{3\pi}{2} + \alpha) = \cos(\frac{7\pi}{2} + \alpha) = \sin\alpha$ ← سوال ۳

$\rightarrow \sin\alpha = \frac{\sqrt{2}}{10} < \frac{\sqrt{2}}{2} \rightarrow \sin\alpha = +\frac{\sqrt{2}}{10}$ ۰٫۵

ب) $\sin(\frac{13\pi}{2} + \alpha) = \sin(\frac{5\pi}{2} + \alpha) = \cos\alpha \rightarrow \tan\alpha = \frac{1}{7} < 1$

$\rightarrow -\cos\alpha = -\frac{7}{\sqrt{50}}$

$\cos^2\alpha = 1 - \sin^2\alpha \rightarrow \cos^2\alpha = \frac{98}{100} \xrightarrow{\text{ربع دوم}} \cos\alpha = -\frac{7\sqrt{2}}{10}$

$\cos(\frac{11\pi}{4} + \alpha) = \cos(2\pi + (-\frac{\pi}{4} + \alpha)) = -\cos(\alpha - \frac{\pi}{4})$

$= -(\cos\alpha\cos\frac{\pi}{4} + \sin\alpha\sin\frac{\pi}{4}) = -(-\frac{\sqrt{2}}{10} \times \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{10} \times \frac{\sqrt{2}}{2}) = \frac{2}{5}$

ب) $1+\tan^2\alpha = \frac{1}{\cos^2\alpha}$ $\xrightarrow{\text{ریشه اول}}$ $\cos\alpha = \frac{\sqrt{۲}}{۱۰}$ $\xrightarrow{\sin^2\alpha+\cos^2\alpha=1}$ $\sin\alpha = \frac{\sqrt{۲}}{۱۰}$

$\sin\left(\frac{۱۳\pi}{۴}+\alpha\right) = \sin\left(۳\pi+\frac{\pi}{۴}+\alpha\right) = -\sin\left(\frac{\pi}{۴}+\alpha\right)$ $\xrightarrow{\text{مثبت شمال}}$ $\frac{-۴}{۵}$

سؤال ۵ ←

$۲\sin^2 x + ۱ - \sin^2 x = \frac{۳}{۴} \rightarrow \sin^2 x = \frac{۱}{۴}$ (۲)

$\rightarrow \cos^2 x = ۲\left(\frac{۱}{۴}\right) + x = \frac{۳}{۴} \rightarrow \cos^2 x = \frac{۲}{۴}$

$\tan^2 x = \frac{\frac{۱}{۴}}{\frac{۲}{۴}} = \frac{۱}{۲}$ ✓

سؤال ۶ ←

$\frac{\sqrt{۲}\times ۶\times \sin\alpha}{۲} = ۳\sqrt{۲}\times\sin\alpha = ۴,۵$ (۲)

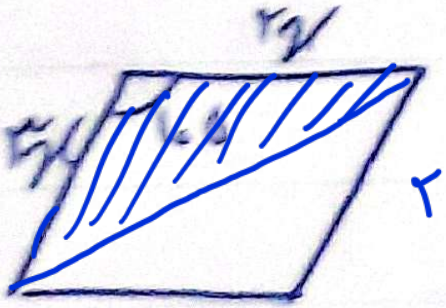
$\rightarrow \frac{\frac{۱۵}{۱۰}}{۳\sqrt{۲}} = \sin\alpha \rightarrow \frac{۳\sqrt{۲}}{۲\sqrt{۲}\times ۲\sqrt{۲}} = \frac{۳\sqrt{۲}}{۴} = \frac{\sqrt{۲}}{۲} = \sin\alpha$

$\rightarrow \alpha < \begin{matrix} ۱۲۰ \\ ۹۰ \end{matrix} \rightarrow \frac{۱۲۰}{۹۰} = ۲$ ✓

$3x^2 = 54 \rightarrow x = 3\sqrt{2} \rightarrow P = 10x = \boxed{30\sqrt{2}}$

Date Subject

سؤال ب ←



$2x\left(\frac{4x \times 3x \times \frac{1}{2}}{2}\right) = \frac{3}{2}x^2 = 24$ (1)

$\rightarrow x^2 = 16 \rightarrow x = 4 \rightarrow 4x + 4x = 10x = 10 \times 4 = 40$

سؤال ا ←

$\frac{10 \times 8 \times \sin A}{2} - \frac{6 \times 8 \times \sin A}{2} = 10,80$ (2)

$\rightarrow 5,0 \sin A = 10,80 \rightarrow \sin A = \frac{1}{2} \rightarrow \cos^2\alpha = 1 - \frac{1}{4}$

$\rightarrow \cos^2\alpha = \frac{3}{4} \rightarrow \cos\alpha = \frac{\sqrt{3}}{2} \rightarrow \tan A = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$ ✓

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سوال ۹ $\overline{AB}$ را برای ساده بودن محاسبات ۱ در نظر گرفتیم:

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$S_{ABC} = \frac{1}{2}$ $\quad \frac{BN}{NC} = \frac{2}{3} \rightarrow \frac{BN}{BC} = \frac{2}{5} \rightarrow BN = \frac{2}{5}BC$

$S_{BMN} = \frac{1}{2}(BM)(xN) = \frac{1}{2} \times (1-x) \times \frac{2}{5} = \frac{1-x}{5}$

$\rightarrow \frac{1}{2} = 3 \times \frac{1-x}{5} = 1-x = 0.4 \rightarrow x = \frac{1}{4}$

$BM = 1-x = \frac{3}{4}$

$AM = x = \frac{1}{4}$

$\rightarrow \frac{BM}{AM} = \frac{\frac{3}{4}}{\frac{1}{4}} = 3$

$$\frac{|\sin\alpha|}{\cos\alpha} = \frac{-1}{\cot\alpha} \rightarrow \frac{|\sin\alpha|}{\cos\alpha} = \frac{-\sin\alpha}{\cos\alpha} \rightarrow$$ ← سوال ۱۰

$$|\sin\alpha|\,\cancel{\cos\alpha} = -\sin\alpha\,\cancel{\cos\alpha} \rightarrow \boxed{\sin\alpha = -}$$ ✓ ۱٫۷۵

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

$$\rightarrow \boxed{\cos\alpha = -} \text{ ✓ } \longrightarrow$$ در ناحیه α

سوم ← $\cos\alpha$ منفی و $\sin\alpha$

۹)

$$S_{\overset{\triangle}{ABC}} = \frac{۱}{۲} AB \times ۵x \times \sin \hat{B}$$

$$S_{\overset{\triangle}{BMN}} = \frac{۱}{۲} BM \times ۳x \times \sin \hat{B} \longrightarrow \frac{S_{\overset{\triangle}{ABC}}}{S_{\overset{\triangle}{BMN}}} = \frac{۵x \times AB}{۳x \times BM} = ۳$$

$$\frac{BM}{AB} = \frac{۵}{۹} \rightarrow \frac{\overset{۵x}{BM}}{\underset{۴x}{AM} + BM} = \frac{۵}{۹} \rightarrow \frac{BM}{AM} = \boxed{\frac{۵}{۴}}$$