تکلیف شماره ۱۸ — نگار دلفاری — ۲۰

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

$\tan(2\pi+\frac{3\pi}{4}) + \sin(2\pi+\frac{7\pi}{4})\cos(2\pi+\frac{5\pi}{4})$

$-1 + (-\frac{\sqrt2}{2}\times -\frac{\sqrt2}{2}) = -1 + \frac{1}{2} = -\frac{1}{2}$

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

$\tan(2\pi+\frac{5\pi}{6})\sin(2\pi+\frac{5\pi}{3}) + \cos(2\pi+\frac{4\pi}{3})$

$(-\frac{\sqrt3}{3}\times -\frac{\sqrt3}{2}) - \frac{1}{2} = \frac{1}{2} - \frac{1}{2} = 0$

۲) $\cot x = 4 \quad \frac{\cos x}{\sin x} = 4$

$\frac{3\cos x - \sin x}{\cos x + \sin x} = \frac{12-1}{4+1} = \frac{11}{5}$

۳) $\sin a = 2\cos a$ ربع سوم $[-,-]$

$\sin^2 a = 1 - \cos^2 a \quad 4\cos^2 a = 1 - \cos^2 a$ ربع سوم غ ق ق

$5\cos^2 a = 1 \quad \cos a = \pm\sqrt{\frac{1}{5}} \rightarrow \cos a = -\frac{1}{\sqrt5} = -\frac{\sqrt5}{5}$

۴) الف) $\cos(\frac{11\pi}{4} + a)$ $(2\pi + \frac{3\pi}{4})$ $= (-\frac{\sqrt2}{2}\times -\frac{7\sqrt2}{10}) - (\frac{\sqrt2}{2}\times\frac{\sqrt2}{10}) = \frac{14}{20} - \frac{2}{20} = \frac{12}{20} = \frac{3}{5}$

$\sin^2 x + \cos^2 x = 1 \quad \cos^2 x = 1 - \frac{2}{100} \quad \cos a = \pm\frac{7\sqrt2}{10}$ غ ق ق

ب) $\sin(\frac{13\pi}{4} + a)$ $(2\pi + \frac{5\pi}{4} \rightarrow -\frac{\sqrt2}{2})$ $= (-\frac{\sqrt2}{2}\times\frac{7\sqrt2}{10}) + (-\frac{\sqrt2}{2}\times\frac{\sqrt2}{10}) = -\frac{14}{20} - \frac{2}{20} = -\frac{16}{20} = -\frac{4}{5}$

$\tan a$ [illegible] $\sqrt{1+49} = 5\sqrt2 \quad \sin a = \frac{\sqrt2}{10} \Rightarrow \cos a = \frac{7\sqrt2}{10}$

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

$2\sin^2 x + \cos^2 x = \frac{4}{3}$ (۱۵)

$2\sin^2 x + 1 - \sin^2 x$

$\sin^2 x = \frac{4}{3} - \frac{3}{3} = \frac{1}{3}$

$\tan^2 x \cdot \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{2}$ گزینه ۱

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

$\cos^2 x = 2 - \frac{4}{3} = \frac{2}{3}$

$S_{\triangle} = \frac{1}{2} ab \sin\alpha$ $4,8 = \frac{1}{2} \times 4 \times \sqrt{3} \times \sin\alpha$ (۱۴)

$2\sqrt{3}\sin\alpha = 4$ $\sin\alpha = \frac{2}{2\sqrt{3}} = \frac{\sqrt{3}}{2}$

$\frac{a_{max}}{a_{min}} = \frac{120}{60} = 2$ گزینه ۱

$\Downarrow$

$a = 60^\circ \text{ یا } 120^\circ$

$S_{\square} = ab\sin\alpha \Rightarrow \frac{3}{2} a^2 \times \frac{1}{2} = 6\sqrt{2}$ $a^2 = 12$ $a = 4\sqrt{2}$

$\frac{a}{b} = \frac{2}{3}$ $b = \frac{3}{2}a$ (۱۷)

$\Downarrow$

$b = 6\sqrt{2}$

$P_{\square} = 2a + 2b = 12\sqrt{2} + 18\sqrt{2} = 30\sqrt{2}$

گزینه ۱

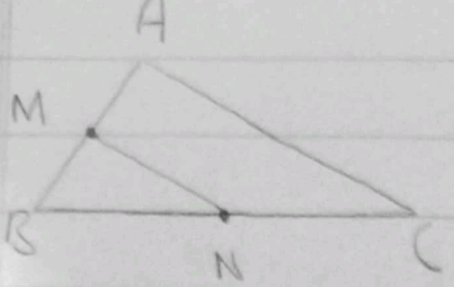
$\frac{1}{2} AC \times AB \times \sin A - \frac{1}{2} AD \times AE \sin A = 1,8$ (۱۸)

$\frac{1}{2} \times 7 \times 5 \times \sin A - \frac{1}{2} \times 7 \times 4 \times \sin A = 1,8$

$\sin A (35 - 28) = 3,6$ $\sin A = \frac{1}{2}$ $\tan A = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}}$ گزینه ۲

چون حاده $\Rightarrow A = 30^\circ \Rightarrow \cos A = \frac{\sqrt{3}}{2}$

۱۹



$۱\overline{BN} = ۴\overline{NC}$

$\frac{1}{۲} AB \times BC \times \sin B = ۴ \times \frac{1}{۲} \times BN \times BM \times \sin B$

$(AM + BM) \times (BN + CN) = ۴(BN) \times (BM)$

$\frac{۵}{۴} BN$

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

$\frac{BM}{AM} = \frac{۵}{۴}$ جواب

$۱۴ BM = ۵ AM$

$BM = \frac{۵}{۴} AM$

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$\frac{|\sin a|}{\cos a} = -\frac{1}{\cot a}$ $\quad \frac{1}{\sqrt{\cos^2 a}} - \tan a = \frac{1 + \sin a}{|\cos a|}$

$\frac{|\sin a|}{\cos a} = \frac{-\sin a}{\cos a}$ $\quad -\frac{\sin a}{\cos a} = \frac{1 + \sin a - 1}{|\cos a|}$

$|\sin a| = -\sin a$ $\quad \frac{\sin a}{-\cos a} = \frac{\sin a}{|\cos a|}$ $\quad |\cos| = -\cos a$

$\sin a < 0$ $\quad \cos a < 0$

انتهای کمان a در ناحیه سوم مثلثاتی است.