تکلیف ۱۴   به نام خدا   برهام ستاری - دوازدهم تجربی B

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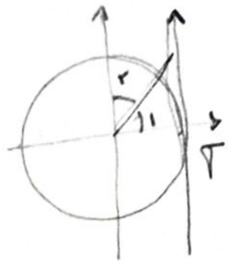


$TB = \tan\beta = \cot\alpha \quad (\alpha+\beta = 90^\circ)$

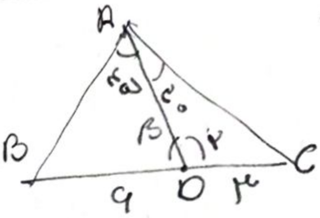
$OA = r = 1 \,,\, OT = 1 \longrightarrow OB^2 = (OT)^2 + (TB)^2$

$OB = \sqrt{1+\cot^2\alpha} \longrightarrow OB = \frac{1}{\sin\alpha}$

$(\frac{1}{\sin^2\alpha})$

$AB = OB - OA = \frac{1}{\sin\alpha} - 1$

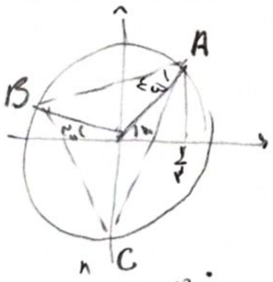
۲-



$\sin\alpha = \sin\beta \quad (\alpha+\beta = 180^\circ)$

$\frac{3}{\sin 30^\circ} = \frac{AC}{\sin\alpha} \,,\, \frac{6}{\sin 45^\circ} = \frac{AB}{\sin\beta} \longrightarrow \frac{AB}{AC} = \frac{6\sqrt{2}}{6} = \sqrt{2}$

۳-

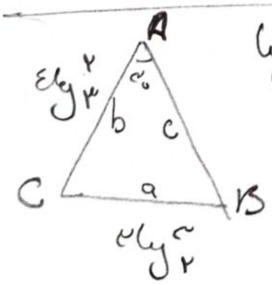


$\hat{COA} = 150 \,,\, \hat{BOC} = 120 \xrightarrow{\text{قضیه کسینوس}} AC = \frac{\sqrt{2}+\sqrt{6}}{2} \,,\, BC = \sqrt{3}$

$P = \frac{3+\sqrt{2}+\sqrt{6}+2\sqrt{3}}{2}$ *

$\hat{A} = \frac{\hat{BC}}{2} \xrightarrow{120^\circ} A = 60^\circ \quad \sin A \times \frac{1}{2} \times AC \times AB = S_\triangle \longrightarrow \frac{\sqrt{3}}{2} \times \frac{1}{2} \times \frac{\sqrt{2}+\sqrt{6}}{2} \times \sqrt{2} = \frac{3+\sqrt{3}}{4}$ *

۴-



$tg^2_3 = t \quad CB = \sqrt{16t^2 + c^2 - \sqrt{3}\,4tc} \to \frac{9}{t^2} = 16t + t^2 - 4\sqrt{3}\, tc \to c = \frac{b\sqrt{3}+\sqrt{4a^2-b^2}}{2}$

$S_\triangle = \sin\hat{A} \times \frac{1}{2} \times 4t \times AB = \frac{bc}{4}$

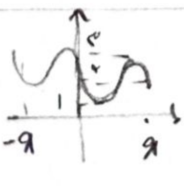
$c = \frac{4\sqrt{3}T + \frac{\sqrt{36-16t}}{t}}{2} \to \frac{bc}{4} = S \xrightarrow{t = tg^2_3} S = 2\sqrt{3}(tg^2_3)^2 + \sqrt{9-4(tg^2_3)^4}$

۵-

$2x^4 - x^2 + \sin^2(\alpha)(\cos 2\alpha) \xrightarrow{x=\cos\alpha} \cos^2\alpha(\cos 2\alpha) + \underbrace{\sin^2\alpha(\cos 2\alpha)}_{(\cos^2\alpha \sin^2\alpha)(\cos 2\alpha)}$

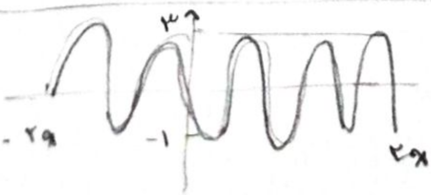
$\cos 2\alpha = 1 \to 2\alpha = \pi \to \frac{\pi}{2} = 1 \to \sin 2\alpha = 0$

۶- الف)



$T = \pi$

ب)



$T = 2$

ادامه سری

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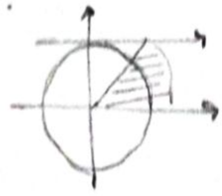
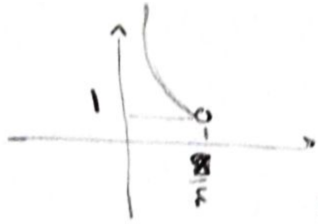
$\cot\alpha \quad 0 < \alpha < \frac{\pi}{4}$





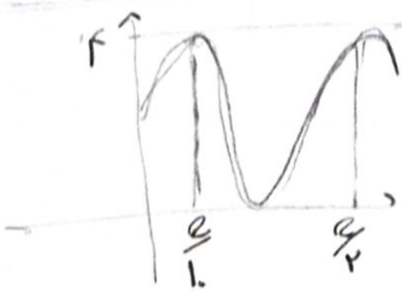
$R \in (1, +\infty)$

$\sin\alpha \quad \alpha \leq 0$

$R \in [-1, 1]$

$R_f \in [-1, +\infty)$

۸-



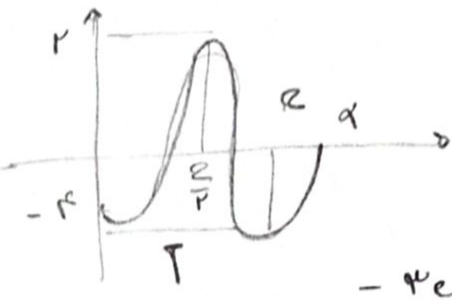
$y = a + b\sin(cx)\cos(cx)\cos(2cx) = a + \frac{b}{4}\sin(4cx)$

$T = \frac{2\pi}{|4c|} = \frac{2\pi}{5} \rightarrow c = \frac{5}{4}$

$a + |\frac{b}{4}|$, $a - |\frac{b}{4}|$ $\Big\}$ $a = 2 \rightarrow \frac{b}{4} = 2, \ b = 8$

$\Big\}\ \frac{bc}{a} = 5$

۹-



$a\cos bx + c \qquad \left.\begin{array}{l} |a| + c = 2 \\ -|a| + c = -4 \end{array}\right\} c = -1, \ a = \pm 3$

$T = \pi, \ b = 2$

$+3$ ✗, -3 ✓

$-3\cos 2\alpha - 1 = 0 \rightarrow -\frac{1}{3} = \cos 2\alpha \rightarrow |\tan 2\alpha| = 2\sqrt{2}$

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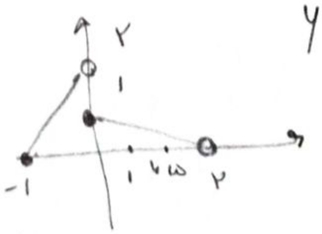
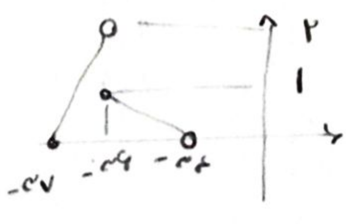


$y = -\frac{1}{2}x + 1 \quad x = \frac{3}{2} \rightarrow y = \frac{1}{4}$



$y = (-74, 5) = y(65) = \frac{1}{4}$