4 «پاسخ کل سرفصل» «دوازدهم دفتر A» «تکلیف ۱۴»

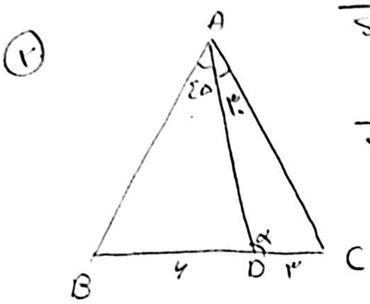
(۱) (۵)

$OB^2 = OT^2 + BT^2 \to OB^2 = 1 + \cot^2\alpha \to OB^2 = 1 + \cot^2\alpha$

$1 + \cot^2\alpha = \frac{1}{\sin^2\alpha} \to OB = \frac{1}{|\sin\alpha|} \xrightarrow[OB>0]{\text{ناحیه اول } \alpha} OB = \frac{1}{\sin\alpha}$

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

(۲)



$\frac{BD}{\sin A_1} = \frac{AD}{\sin B} \to \frac{12}{\sqrt{2}} \sin B = AD$

$\frac{CD}{\sin A_2} = \frac{AD}{\sin C} \to 6\sin C = AD$

$\Rightarrow 6\sin C = \frac{12}{\sqrt{2}} \sin B \to \sin C = \sqrt{2}\sin B$

(۲)

(۳) (۵)

الف) $A\left|\begin{matrix}\frac{1}{2}\\ \frac{\sqrt{3}}{2}\end{matrix}\right. \quad B\left|\begin{matrix}-\frac{\sqrt{3}}{2}\\ \frac{1}{2}\end{matrix}\right. \quad C\left|\begin{matrix}0\\ -1\end{matrix}\right.$

ب) $AB = \sqrt{2} \quad BC = \sqrt{3}$

$AC = \sqrt{2 + \sqrt{3}}$

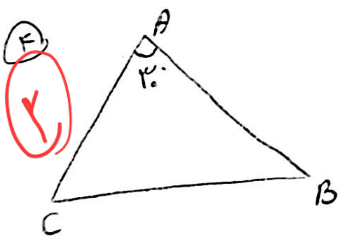
$S_{\triangle OAB} = \frac{1}{2}$

$S_{\triangle OBC} = \frac{\sqrt{3}}{4} \qquad S_{ABC} = \frac{3 + \sqrt{3}}{4}$

$S_{\triangle OAC} = \frac{1}{4}$

محیط $= \sqrt{3} + \sqrt{2} + \sqrt{2 + \sqrt{3}}$

(۴) (۲)



$S_{\triangle ABC} = \frac{1}{2} \times AB \times AC \times \sin 30^\circ = \frac{1}{2} \times \log_2^{36} \times \log_3^{16} \times \frac{1}{2} =$

$\frac{1}{4} \times 2 \times 4 \times 3 \times \log_2^3 \times \log_3^2 = 3$

$f(\cos\alpha) = 2$

(۵) (۵)

$\to 2\cos^4\alpha - \cos^2\alpha - \sin^2\alpha$

$2\cos^4\alpha - \cos^2\alpha - 2\sin^4\alpha + \sin^2\alpha = 1$

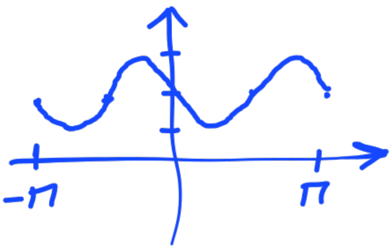
$2\cos^4\alpha - \sin^4\alpha + \sin^2\alpha - \cos^2\alpha = 1 \to 2(\cos^2\alpha - \sin^2\alpha)(\cos^2\alpha + \sin^2\alpha) + \sin^2\alpha - \cos^2\alpha = 1$

$2\cos 2\alpha - (\cos^2\alpha - \sin^2\alpha) = 2\cos 2\alpha - \cos 2\alpha = 1$

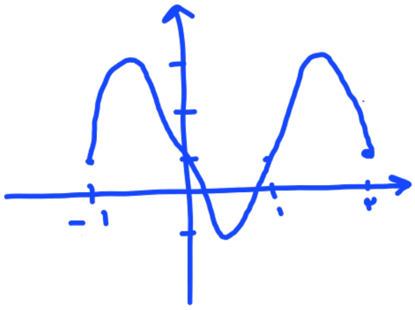
$\cos 2\alpha = 1 \to \sin^2 2\alpha + \cos^2 2\alpha = 1 \to \sin 2\alpha = 0$

۶) الف) $T = 2\pi$ ، $R_f = [1, 3]$

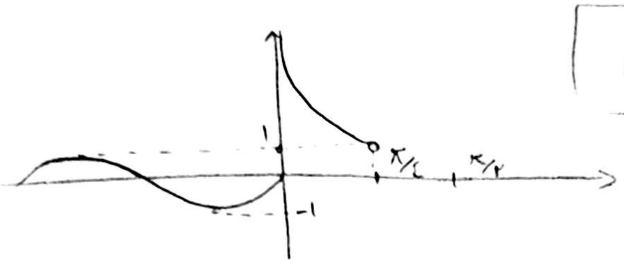
۵



ب) $T = 4$ ، $R_f = [-1, 3]$



۷) ۱



$R_f = \mathbb{R}$

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

۸)

$T = \frac{5\pi}{10} - \frac{\pi}{10} = \frac{4\pi}{10} = \frac{2\pi}{5} \rightarrow \frac{2\pi}{5} = \frac{2\pi}{|4c|} , |c| = \frac{5}{4} \rightarrow c = \frac{5}{4}$

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

$a = \frac{max + min}{2} \rightarrow a = \frac{4}{2} = 2 \qquad \frac{b}{4} = 2 \rightarrow \boxed{b = 8}$

۲

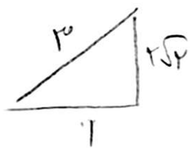
$\Rightarrow \frac{\frac{5}{4} \times 8}{2} = 5$ ✓

۹) $c = \frac{max + min}{2} \rightarrow \frac{-4 + 2}{2} = -1 \qquad a = \frac{max - min}{2} \rightarrow a = \frac{2 + 4}{2} = -3$

$T = \pi \rightarrow \frac{2\pi}{|b|} = \pi \rightarrow |b| = 2 \rightarrow b = \pm 2 \rightarrow$ چون cos است مثبت و منفی آن فرقی ندارد!

۲

$f(x) = -3\cos 2x - 1 \rightarrow -3\cos 2\alpha - 1 = 0 \rightarrow \cos 2\alpha = \frac{-1}{3} \rightarrow \sin 2\alpha = \frac{2\sqrt{2}}{3}$



$|\tan 2\alpha| = \left|\frac{\frac{2\sqrt{2}}{3}}{\frac{-1}{3}}\right| = \boxed{2\sqrt{2}}$ ✓

$\boxed{f(-1.5) = \frac{1}{4}}$

۱۰) ۰

$-34.5 \div 3 = -11.5 \rightarrow -11.5 \div 3 = -3.8$ ، باقی‌مانده -0.1

$\rightarrow y = 2x + 2 \xrightarrow{x = -0.1} y = -0.2 + 2 = 1.8$

$f(-34.5) = f(-36 + 1.5) = f(1.5)$

$f(x) = \begin{cases} -\frac{1}{2}x + 1 & 0 < x \leq 2 \\ 2x + 2 & -1 \leq x < 0 \end{cases}$