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نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس ..... پسر A

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$BT = \tan\left(\frac{\pi}{2}-\alpha\right) = \cot\alpha$
$OT = 1$
$\Rightarrow OB = \sqrt{1+\cot^2\alpha} = \frac{1}{\sin\alpha}$

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

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$\frac{AD}{\sin B} = \frac{BD}{\sin A_1} \Rightarrow \frac{AD}{\sin B} = \frac{9}{\frac{\sqrt{2}}{2}} = \frac{18}{\sqrt{2}} = 9\sqrt{2}$

$\frac{AD}{\sin C} = \frac{DC}{\sin A_2} \Rightarrow \frac{AD}{\sin C} = \frac{3}{\frac{1}{2}} = 6$

$\frac{\frac{AD}{\sin B}}{\frac{AD}{\sin C}} = \frac{9\sqrt{2}}{6} = \sqrt{2}$

$\frac{AB}{\sin C} = \frac{AC}{\sin B} \Rightarrow \frac{AB}{AC} = \frac{\sin C}{\sin B} = \sqrt{2}$ ✓

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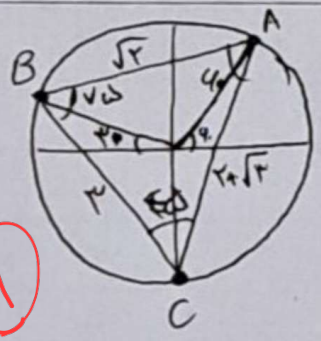

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$S = \frac{1}{2}ab\sin\alpha = \frac{1}{2}\times\frac{\sqrt{2}}{2}\times 3\times(2+\sqrt{3}) = \frac{6+3\sqrt{2}}{2\sqrt{2}}$ الف)

$S = \frac{3+\sqrt{3}}{4}$

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

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

ب) محیط: $3+\sqrt{2}+\sqrt{2+2} = 5+\sqrt{2}+\sqrt{3}$

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

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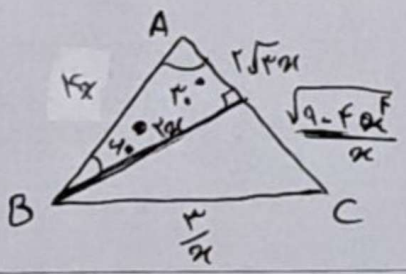
$BC = \log_7^{27} = 3\log_2^3 = 3\times\frac{1}{\log_3^2} = \frac{3}{\alpha}$ $AC = \log_3^{14} = 4\log_3^2 = 4\times\alpha = 4\alpha$



$S = \frac{1}{2}ab\sin\alpha = \frac{1}{2}\times\frac{1}{2}\times 4\alpha\times\frac{\sqrt{9-4\alpha^2}+2\sqrt{2}\alpha^2}{\alpha} =$

$\sqrt{9-4\left(\log_3^2\right)^4} + 2\sqrt{3}\left(\log_3^2\right)^2$ ✓

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$\frac{2\alpha^4-\alpha^2-\sin^2\alpha\left(2\sin^2\alpha-1\right)}{\alpha-\cos\alpha} = 1$

$2\cos^4\alpha-\cos^2\alpha-\sin^2\alpha\left(2\sin^2\alpha-1\right) =$

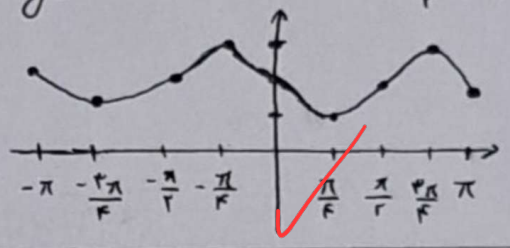
$\cos^2\alpha\left(2\cos^2\alpha-1\right)-\sin^2\alpha\left(2\sin^2\alpha-1\right) =$

$= \cos^2\alpha\left(\cos 2\alpha\right)-\sin^2\alpha\left(-\cos 2\alpha\right) = \cos 2\alpha\left(\cos^2\alpha+\sin^2\alpha\right) = 1 \Rightarrow$

$\cos 2\alpha = 1$ $\sin^2 2\alpha+\cos^2 2\alpha = 1 \Rightarrow \sin 2\alpha = \sqrt{1-1} = 0$ ✓

الف) $y = -2\sin x \cos x + 2 \quad [-\pi, \pi]$

$y = -\sin 2x + 2 \qquad T = \frac{2\pi}{2} = \pi$



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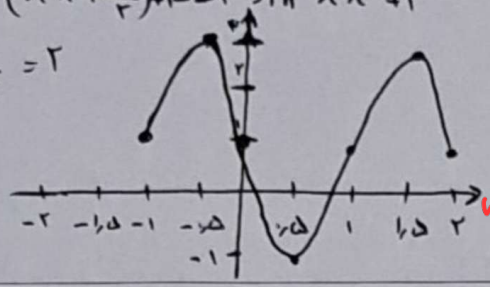
ب) $y = 2\cos\left(x + \frac{1}{2}\right)\pi + 1 \quad [-\pi, 2\pi]$

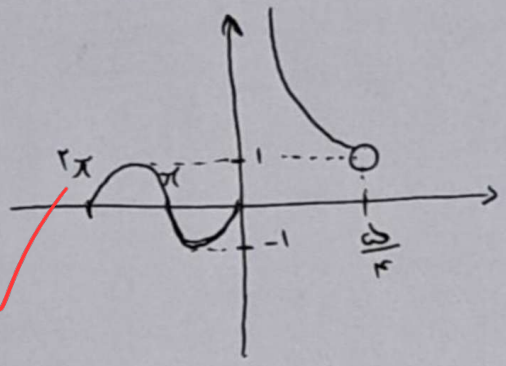
$2\cos\left(x\pi + \frac{\pi}{2}\right) + 1 = -2\sin x\pi + 1$

$T = \frac{2\pi}{\pi} = 2$



✓

$$f(x) = \begin{cases} \cot x & 0 < x < \frac{\pi}{4} \\ \sin x & x \geq 0 \end{cases}$$



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

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

$a + \frac{b}{4}\sin(4cx) \qquad T = \frac{2\pi}{4c} = \frac{4\pi}{10} \Rightarrow 4c = 5 \Rightarrow c = \frac{5}{4} \qquad a = 2$

$2 = \frac{b}{4} \Rightarrow b = 8$

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

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$f(x) = a\cos bx + c \qquad T = \frac{2\pi}{b} = \pi \Rightarrow b = 2 \qquad a = -3 \quad c = -1$

$f(x) = -3\cos 2x - 1 \Rightarrow \cos 2x = \frac{1}{3} \qquad 1 + \tan^2 2x = \frac{1}{\cos^2 2x} = \frac{1}{\frac{1}{9}} = 9 \Rightarrow$

$\tan^2 2x = 8 \Rightarrow \tan 2x = \sqrt{8} = 2\sqrt{2} \qquad |\tan 2x| = 2\sqrt{2}$ ✓

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$f(-2.5) = f(-2 + 1.5) = f(1.5) = \frac{1}{2}$

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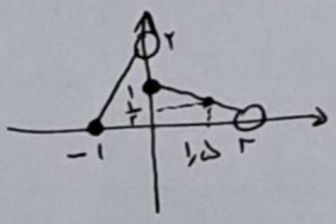

$$f(x) = \begin{cases} -\frac{1}{2}x + 1 & 0 \leq x < 2 \\ 2x + 2 & -1 \leq x < 0 \end{cases} \rightarrow f(1.5) = \frac{1}{2}$$