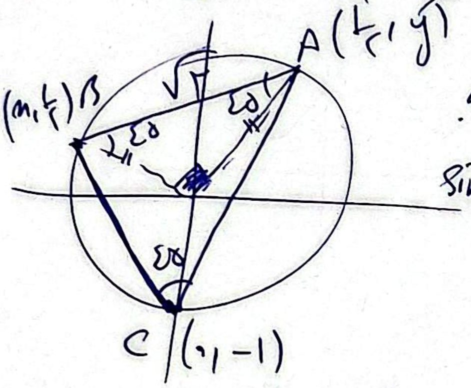
شماره تکلیف: ۱۴ سید سجاد

$$\left.\begin{array}{l} BT = \tan\left(\frac{\pi}{2}-\alpha\right) = \cot\alpha \\ OT = 1 \end{array}\right\} \rightarrow OB = \sqrt{1+\cot^2\alpha} = \frac{1}{\sin\alpha} \quad (1)$$

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

(۲)

$$\left.\begin{array}{l} \dfrac{AB}{\sin(\pi-\alpha)} = \dfrac{6}{\frac{\sqrt{2}}{2}} = \dfrac{12}{\sqrt{2}} \\[2ex] \dfrac{AC}{\sin\alpha} = \dfrac{3}{\frac{1}{2}} = 6 \end{array}\right\} \rightarrow \frac{AB}{AC} = \frac{2}{\sqrt{2}} = \sqrt{2}$$



۳) می‌توان نتیجه گرفت چون $\cos A$:

$\sin B$ برابر است پس $\sin A = -\cos B$

پس $\boxed{y = -3}$

$$\left(-3-\frac{1}{2}\right)^2 + \left(\frac{1}{2}-3\right)^2 = 2 \Rightarrow x^2 + \frac{1}{4} = 1 \quad \boxed{x = \frac{-\sqrt{3}}{2}}$$

$$AC = \sqrt{\left(\frac{\sqrt{3}}{2}+1\right)^2 + \left(\frac{1}{2}\right)^2} = \sqrt{2+\sqrt{3}} = \frac{\sqrt{6}+\sqrt{2}}{2}$$

$$BC = \sqrt{\frac{9}{4}+\frac{3}{4}} = \sqrt{3}$$

الف) $S_{A\hat{B}C} = \frac{1}{2} \times \frac{\sqrt{2}}{2} \times \frac{\sqrt{6}+\sqrt{2}}{2} \times \sqrt{3} = \frac{3+\sqrt{3}}{4}$

ب) $2P_{A\hat{B}C} = \sqrt{3} + \frac{\sqrt{6}+\sqrt{2}}{2} + \sqrt{2} = \frac{\sqrt{6}+2\sqrt{3}+3\sqrt{2}}{2}$

$S_{A\hat{B}C} = \frac{1}{2}\times\frac{1}{2}\times\cancel{\log_{3}^{27}}\times\cancel{\log_{4}^{16}} = \frac{12}{4} = 3$ ۴

$= 3\log_{3}^{3} \quad 2\log_{4}^{4}$

$x = \cos\alpha \longrightarrow$ ۵

$\underbrace{2\cos^4\alpha - \cos^2\alpha}_{\cos^2\alpha(\cancel{2\cos^2\alpha - 1})} - \sin^2\alpha(\underbrace{\cancel{2\sin^2\alpha - 1}}_{-\cos 2\alpha}) = \boxed{\cos 2\alpha}$

$\cos^2\alpha\,(\underbrace{2\cos^2\alpha - 1}_{\cos 2\alpha})$

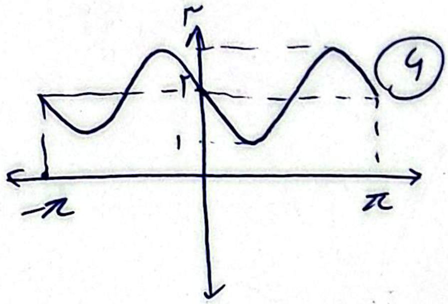
$\cos 2\alpha = 1 \rightarrow \sin 2\alpha = \sqrt{1-1} = 0 \Rightarrow$

$\boxed{\sin 2\alpha = 0}$

۶

الف) $y = -\sin 2x + 2$

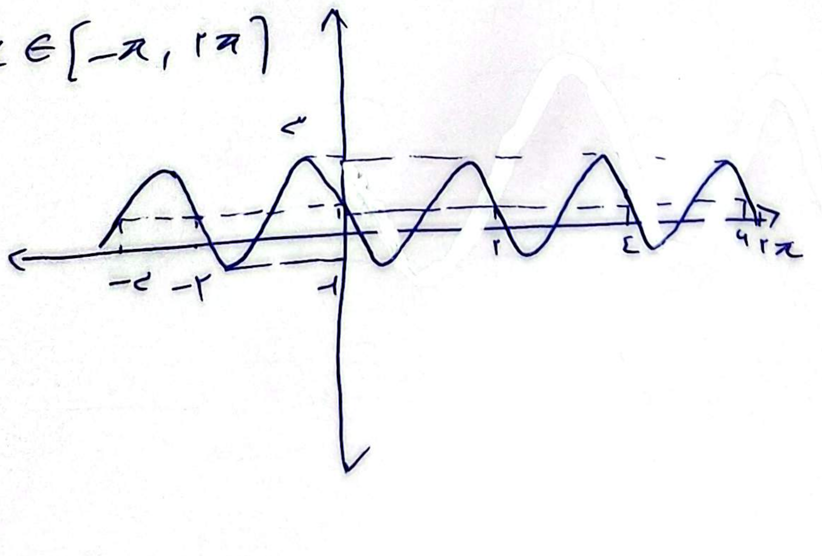
$T = \frac{2\pi}{2} = \pi$



ب) $y = 2\cos(\pi x + \frac{\pi}{2}) + 1 \rightarrow y = -2\sin \pi x + 1$

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

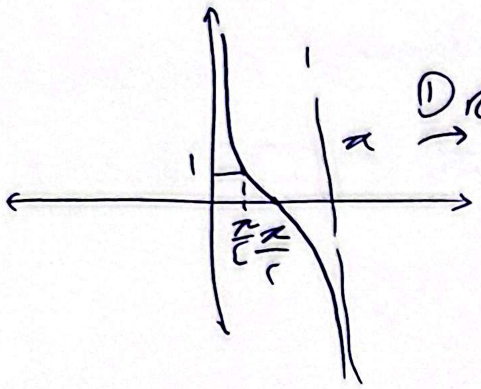
$x \in [-\pi, 2\pi]$



نمونه ۱۴۰۳ (س-۳)

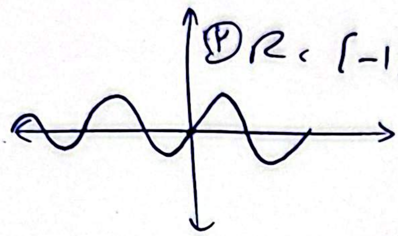
(۷)

$y=\cot x \quad (0<x<\frac{\pi}{4})$



① $R=(1,+\infty)$

$y=\sin x \quad (x<0)$



② $R=[-1,1]$

$① \cup ② \longrightarrow R_f=[-1,+\infty)$

(۸)

$y=a+\frac{b}{4}\sin(4Cx)$

براساس شکل $\frac{b}{4}\times C>0$ چون $C>0$ پس $b>0$

$T=\frac{\pi}{2}-\frac{\pi}{10}=\frac{4\pi}{10}=\frac{2\pi}{5} \Rightarrow T=\frac{2\pi}{|4C|}=\frac{2\pi}{5} \Rightarrow \boxed{C=\frac{5}{4}}$

$|\frac{b}{4}|+a=4$

$-|\frac{b}{4}|+a=0$

$\Rightarrow \boxed{a=2}$

$|\frac{b}{4}|=2 \rightarrow \boxed{b=8}$

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

(۴)

$T=\pi \rightarrow |b|=\frac{2\pi}{\pi}=2 \rightarrow b=\pm 2$

$|a|+C=2$

$-|a|+C=-4$

$\rightarrow C=-1$

$|a|=3 \xrightarrow{\text{شکل}} a=-3$

$\rightarrow y=-3\cos 2x-1 \xrightarrow{x=\alpha} -3\cos 2\alpha-1=0 \Rightarrow \cos 2\alpha=-\frac{1}{3}$

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

1.5

۱۰) $f(-24.5) = f(\cancel{-34.5 + 13\times 2}) = f(1.5)$

بر اساس $1 < x < 2$: شکل معادله خط به معادله $y = -\frac{1}{2}x+1$ است

پس $f(1.5) = -\frac{1}{2} \times \frac{3}{2} + 1 = \frac{-3}{4} + 1 = \boxed{\frac{1}{4}}$