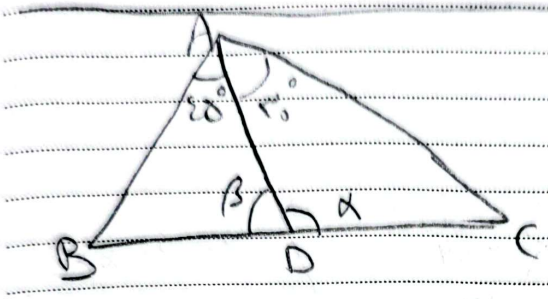
$$\cos\alpha = \frac{OT}{OB} = \frac{1}{OB}$$ ۱



۲

$$\frac{x}{\sin\alpha} = \frac{۳۰}{\frac{1}{۲}}$$

$$۳\sin\alpha \times ۲ \Rightarrow AC$$

$$\sin\alpha = \sin\beta$$

$$\frac{AB}{AC} = \frac{۴\sin\beta \times ۲}{\sqrt{۲}} = \frac{۱۲}{۴\sqrt{۲}} = \frac{۲\sqrt{۲}}{۲} = \sqrt{۲}$$

$$\frac{x}{\sin\beta} = \frac{۴}{\frac{\sqrt{۲}}{۲}} \Rightarrow \frac{۴\sin\beta \times ۲}{\sqrt{۲}} \rightarrow AB$$

۳

$$\vec{a} = B\begin{vmatrix} -\frac{\sqrt{۳}}{۲} \\ \frac{1}{۲} \end{vmatrix} \quad \vec{۳} = A\begin{vmatrix} \frac{1}{۲} \\ \frac{\sqrt{۳}}{۲} \end{vmatrix} \quad C\begin{vmatrix} ۰ \\ -۱ \end{vmatrix}$$

$$\frac{1}{۲}\sin۱۲۰ \times OB \times OC = \frac{\sqrt{۳}}{۴} \qquad \frac{1}{۲}\sin۱۵۰ \times OC \times OA =$$

$$\frac{1}{۲}\sin۹۰ \times OA \times OB = \frac{1}{۲}$$

$$AC = \sqrt{\left(\frac{1}{۲}\right)^۲ + \left(\frac{\sqrt{۳}+۲}{۲}\right)^۲} = \sqrt{۲+\sqrt{۳}}$$

$$AB = \sqrt{\left(\frac{1}{۲}+\frac{\sqrt{۳}}{۲}\right)^۲ + \left(\frac{\sqrt{۳}}{۲}-\frac{1}{۲}\right)^۲} = \sqrt{۲}$$

$$BC = \sqrt{\left(\frac{-\sqrt{۳}}{۲}\right)^۲ + \left(-\frac{۳}{۲}\right)^۲} = \sqrt{۳}$$

جهانی مسجد

ب) مساحت

$$\frac{1}{۴} + \frac{1}{۲} + \frac{\sqrt{۲}}{۴} = \frac{۳+\sqrt{۲}}{۴}$$

ب) محیط

$$\sqrt{۳} + \sqrt{۲} + \sqrt{۲+\sqrt{۳}}$$

۴- $\frac{1}{2}\times \log_2^{27}\times \log_3^{16}\times \frac{1}{2} = \frac{12}{4} = 3$

$$\frac{3\log^3}{\log^2}\times\frac{4\log^2}{\log^{3^2}} = 12$$

۵- $2\cos^4\alpha - \cos^2\alpha - \sin^2\alpha(\underbrace{2\sin^2\alpha - 1}_{-\cos 2\alpha}) = 1$

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

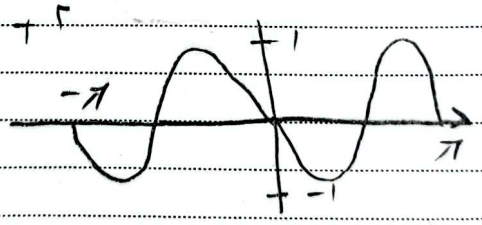
$$\sin 2\alpha = 0$$

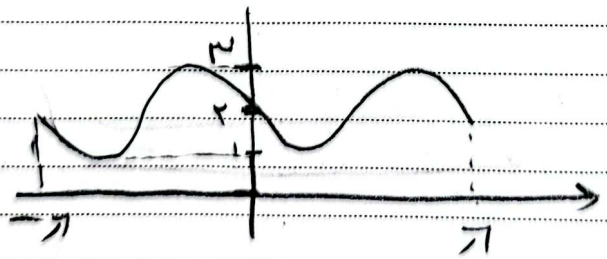
$$\Rightarrow \cos 2\alpha(\cos^2\alpha + \sin^2\alpha) = 1 \Rightarrow \cos 2\alpha = 1$$

۶- الف) $-2\sin\alpha\cos\alpha + 2$

$$= -\sin 2\alpha + 2$$

دوره تناوب: $\frac{2\pi}{2} = \pi$





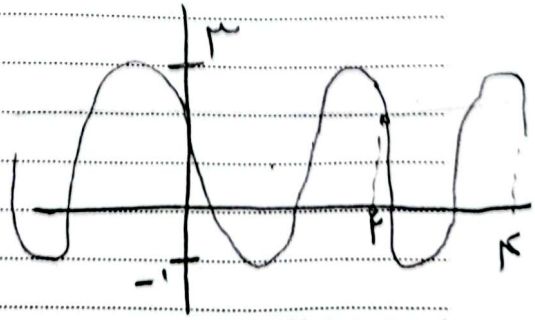
ب) $2\cos(2\pi x + \frac{\pi}{2}) + 1$

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

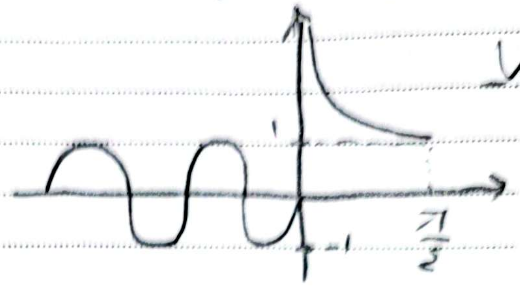
$$T = \frac{2\pi}{2\pi} = 1$$

$$\max = |-2| + 1 = 3$$

$$\min = -|-2| + 1 = -1$$



۷. $f(x)\begin{cases} \cot x & 0<x<\frac{\pi}{2} \\ \sin x & x\le 0 \end{cases}$



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

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۸. $a+b\sin(cx)\cos(cx)\cos(2cx)$ $\quad c>0$

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

$\frac{b}{4}\sin(4cx)+a$ $\qquad$ تناوب $=\frac{5\pi}{10}-\frac{-\pi}{10}=\frac{2\pi}{5}$

$\frac{2\pi}{4c}=\frac{2\pi}{5} \Rightarrow c=\frac{5}{4}$ $\qquad$ $\left|\frac{b}{4}\right|+a=4$, $\; -\left|\frac{b}{4}\right|+a=0$ $\Rightarrow 2a=4,\; a=2$

$\left|\frac{b}{4}\right|=2 \Rightarrow b=\pm 8$ $\qquad$ $\frac{8\times\frac{5}{4}}{2}=5$

---

۹. $b\sin(5\times\frac{\pi}{10})+2=4$

$f(x)=a\sin bx+c$ $\qquad$ تناوب $=\pi$ $\qquad \frac{2\pi}{|b|}=\pi$

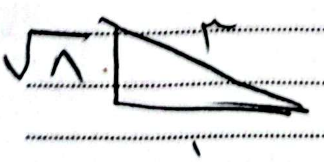
$b=\pm 2$ $\qquad b>0$

$|\tan 2a|$ $\qquad \tan 2a=\sqrt{8}$

$-3\cos 2x-1=0$ $\qquad |a|+c=2$ $\qquad |a|=3$

$\cos 2x=-\frac{1}{3}$ $\qquad -|a|+c=-4$ $\qquad$ طبق شکل

$2c=-2$ $\qquad a<0$

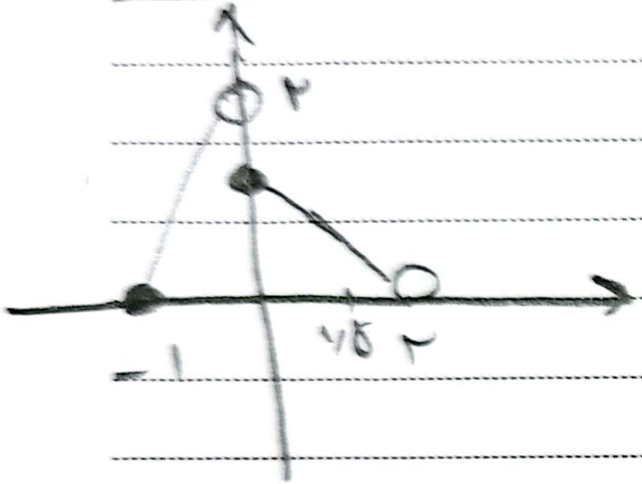


$c=-1$

ط

$f(-٣٤,٥)$

$f(-٣٤-\frac{١}{٢})$



$|\frac{-١}{٠}$ $|\frac{٥}{٢}$ $|\frac{٥}{١}$ $|\frac{٢}{١}$

$٢x+٢$ $\frac{-١}{٢}x+١$ $\frac{-١}{٢}\times\frac{٣}{٢}+١=\frac{-٣}{٤}+\frac{٤}{٤}=\frac{١}{٤}$