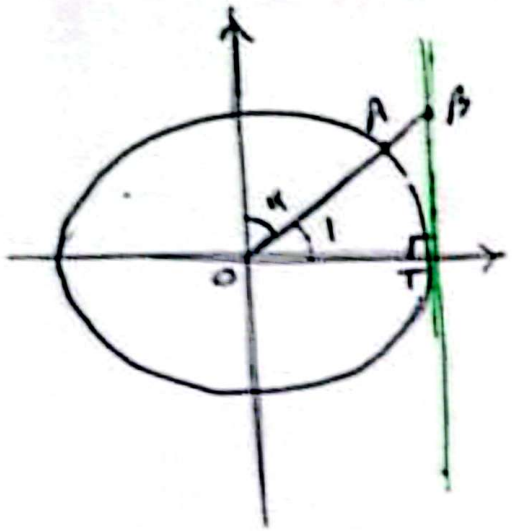
۱- حل تمرین



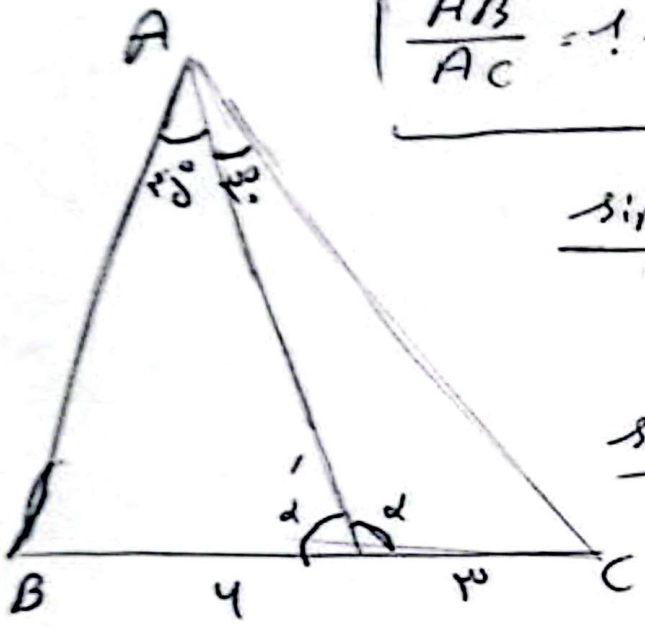
$OB = \tan\left(\frac{\pi}{2} - \alpha\right) = \cot(\alpha)$

$OA \cdot 1$

$AB = \cot\alpha - 1 \quad \frac{\cos\alpha}{\sin\alpha} - 1 = \frac{\cos\alpha - \sin\alpha}{\sin\alpha}$

$\frac{-(\sin\alpha - \cos\alpha)}{\sin\alpha} = \left| \frac{-\sqrt{2}\sin\left(\alpha - \frac{\pi}{4}\right)}{\sin\alpha} \right|$

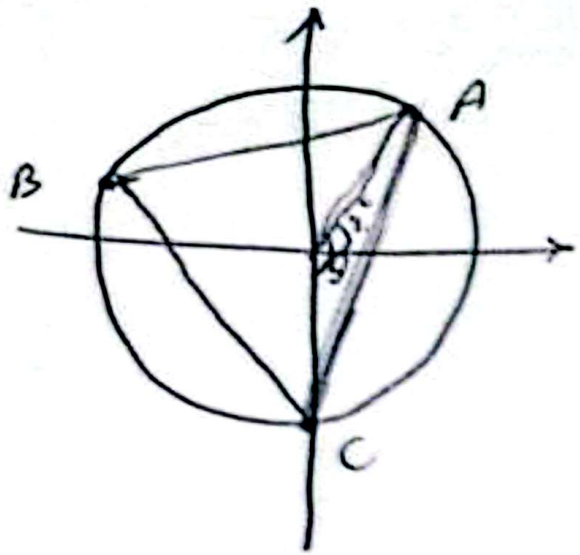
۲-



$\left| \frac{AB}{AC} = 1 \longrightarrow \frac{4\sqrt{2}\sin\alpha}{4\sin\alpha} = \sqrt{2} \right|$

$\frac{\sin 45^\circ}{4} = \frac{\sin\alpha}{AB} \Rightarrow \frac{\sqrt{2}}{12} = \frac{\sin\alpha}{AB} \Rightarrow AB = 4\sqrt{2}\sin\alpha$

$\frac{\sin 30^\circ}{3} = \frac{\sin\alpha}{AC} \Rightarrow \frac{1}{4} = \frac{\sin\alpha}{AC} \Rightarrow AC = 4\sin\alpha$



$A\left|\frac{1}{2}\right.\left.\frac{\sqrt{3}}{2}\right.$ $B\left|\frac{-\sqrt{3}}{2}\right.\left.\frac{1}{2}\right.$ $C|-i$

$AB = \sqrt{\left(\frac{1}{2}+\frac{\sqrt{3}}{2}\right)^2+\left(\frac{\sqrt{3}}{2}-\frac{1}{2}\right)^2} = \sqrt{\left(\frac{4+2\sqrt{3}}{4}\right)+\left(\frac{4-2\sqrt{3}}{4}\right)} = \sqrt{2}$

$BC = \sqrt{\left(-+\frac{\sqrt{3}}{2}\right)^2+\left(\frac{-1+\frac{1}{2}}{-\frac{3}{2}}\right)^2} = \sqrt{\frac{3}{4}+\frac{9}{4}} = \sqrt{3}$

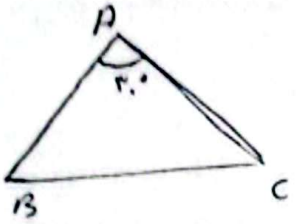
$AC = \sqrt{\left(\frac{1}{2}-0\right)^2+\left(\frac{\sqrt{3}}{2}+\frac{3}{2}\right)^2} = \sqrt{\frac{1}{4}+\frac{9+6\sqrt{3}}{4}} = \sqrt{\frac{10+6\sqrt{3}}{4}} = \sqrt{2+\sqrt{3}}$

$\boxed{\text{Périmètre} = \sqrt{2}+\sqrt{3}+\sqrt{2+\sqrt{3}}}$

$\theta = 2B \quad \theta = 120°$
$B = 60°$

$\boxed{\text{Surface} = \frac{1}{2}\times\frac{\sqrt{2}\left(1+\sqrt{3}\right)}{2}\times\sqrt{2}\times\sqrt{3} = \frac{3+\sqrt{3}}{2}}$

$\sin 75° = \cos 45°\sin 30° + \cos 30°\sin 45° = \frac{\sqrt{2}}{2}\times\frac{1}{2}+\frac{\sqrt{3}}{2}\times\frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{4}+\frac{\sqrt{6}}{4} = \frac{\sqrt{2}+\sqrt{6}}{4}$



$AC = \log_{۳}^{۱۶}$ $\quad S_{\Delta} = \frac{۱}{۲} \times \frac{۱}{۲} \times \log_{۳}^{۱۶} \times \log_{۲}^{۲۷} = \frac{۱}{۴} \times \frac{\log ۱۶}{\log ۳} \times \frac{\log ۲۷}{\log ۲} = ۳$

$BC = \log_{۲}^{۲۷}$

ب-

$۲\cos^{۴}\alpha - m^{۲} - \sin^{۲}\alpha\left(۲\sin^{۲}\alpha - ۱\right) = ۲\cos^{۴}\alpha - \cos^{۲}\alpha - \sin^{۲}\alpha\left(۲\sin^{۲}\alpha - ۱\right) = ۱$

$\cos^{۲}\alpha\left(۲\cos^{۲}\alpha - ۱\right) - \sin^{۲}\alpha\left(۲\sin^{۲}\alpha - ۱\right) = ۱$

$۲\cos^{۲}\alpha - \sin^{۲}\alpha - \cos^{۲}\alpha$ $\quad$ $۲\sin^{۲}\alpha - \sin^{۲}\alpha - \cos^{۲}\alpha$

$(\cos^{۲}\alpha - \sin^{۲}\alpha)$ $\quad$ $\sin^{۲}\alpha - \cos^{۲}\alpha$

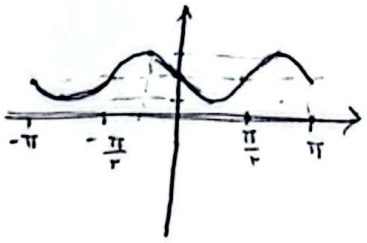
$\cos^{۲}۲\alpha$ $\quad$ $-(\cos^{۲}\alpha - \sin^{۲}\alpha)$

$\cos ۲\alpha$

$\cos^{۲}۲\alpha \cos ۲\alpha + \sin^{۲}\alpha \cos ۲\alpha = ۱$ $\quad \cos ۲\alpha\left(\sin^{۲}\alpha + \cos^{۲}\alpha\right) = ۱$ $\quad \cos ۲\alpha = ۱$

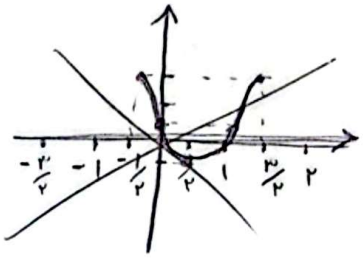
$\sin^{۲}۲\alpha = ۱ - \cos^{۲}۲\alpha = ۰$ $\quad \boxed{\sin ۲\alpha = ۰}$

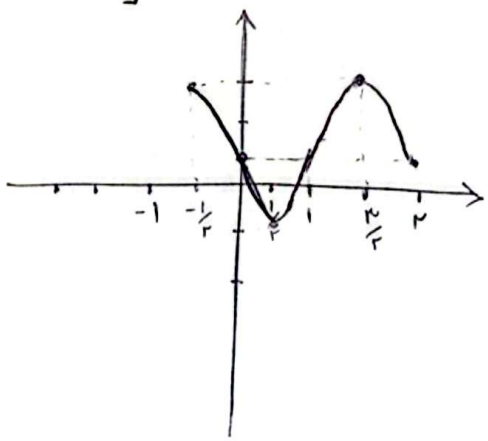
ت-۱) $y = -۲\sin x \cos x + ۲$, $[-\pi, \pi]$ $\quad y = -\sin ۲x + ۲$ $\quad T = \frac{۲\pi}{۲} = \pi$



ب) $y = ۲\cos\left(x + \frac{۱}{۲}\right)\pi + ۱$, $[-\pi, ۲\pi] \rightarrow [-۱, ۲]$

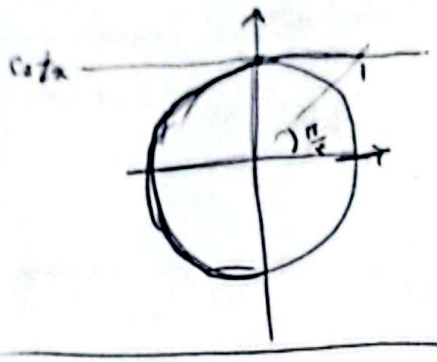
$T = \frac{۲\pi}{\pi} = ۲$





-۷

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

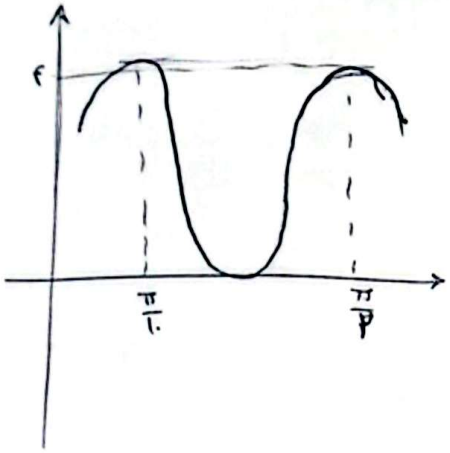


$-\sin x$, $x\le 0$ $\quad -1<f(x)<1$

$0<f(x)<1$ $\quad R_f=[-1,1)-\{0\}$

-۸

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



$a=2$

$y=2+b\left(\frac{1}{2}\sin(4cx)\right) \Rightarrow 2+\frac{b}{2}\sin(4cx)$

$b=8$

$\sin\left(\frac{4c\pi}{10}\right)=1 \quad c=\frac{5}{4}\sin\left(\frac{5\pi}{10}\right)$

$c=\frac{5}{4}$ $\quad \sin(2c\pi)=1 \quad c=\frac{5}{4}\sin\left(\frac{5\pi}{2}\right)$

$$\frac{8\times\frac{5}{4}}{4}=5$$

-۹

$f(x)=a\cos bx+c$

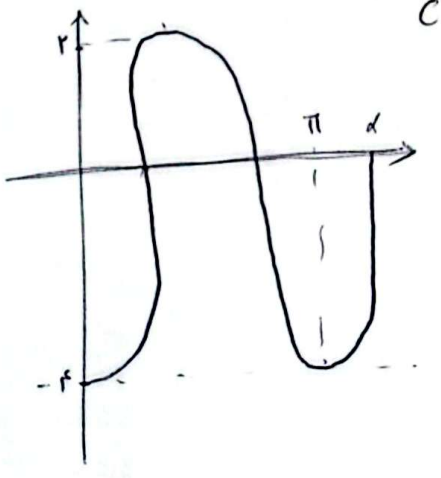
$a=-3$ $\quad b=2$

$c=-1$

$-3\cos 2x-1=0$

$-3\cos^2\alpha=1$

$\cos^2\alpha=-\frac{1}{3}$



$\tan^2\alpha+1=\frac{1}{\cos^2\alpha} \quad \tan^2\alpha=\frac{1}{\cos^2\alpha}-1$

$\tan 2\alpha=\frac{\sin 2\alpha}{\cos 2\alpha}=\frac{\frac{2\sqrt{2}}{3}}{\frac{1}{3}}=2\sqrt{2}$

$|\cos 2\alpha|=\frac{1}{3}$

$|-\sin 2\alpha|=\frac{2\sqrt{2}}{3}$