ریاضیات طلوعی - پاسخ تشریحی - لطیف

-۱

$\sin\alpha = \cos 1$

$\tan 1 - 1 = AB$

$\frac{\sin 1}{\cos 1} \rightarrow \frac{\sqrt{1-\sin\alpha}}{\sin\alpha} - 1 = AB$

$\sin 1 + \cos 1 = 1^۲ \rightarrow \sin 1 = \sqrt{1-\cos 1}$

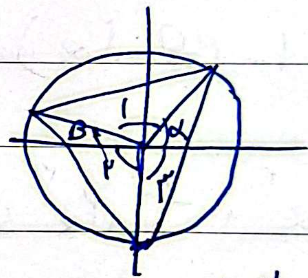
-۲

$\frac{۱۲}{\sqrt{۲}} = \frac{۶}{\frac{\sqrt{۲}}{۲}} = \frac{AB}{\underbrace{\sin(۱۸۰-\alpha)}_{\sin\alpha}} \rightarrow AB = \frac{۱۲\sin\alpha}{\sqrt{۲}}$

$\frac{AB}{AC} = \frac{\frac{۱۲\sin\alpha}{\sqrt{۲}}}{\frac{۶\sin\alpha}{۱}} = \frac{۱۲}{۶\sqrt{۲}} = \frac{۲}{\sqrt{۲}} = \sqrt{۲}$

-۳

الف)



$\alpha + \beta = ۹۰$

$S_۱ = \frac{۱}{۲}\sin ۹۰ \times OA \times OB = \frac{۱}{۲}$

$S_۲ = \frac{۱}{۲}\sin ۱۲۰ \times OB \times OC = \frac{\sqrt{۳}}{۴}$

$S_۳ = \frac{۱}{۲}\sin ۱۵۰ \times OC \times OA = \frac{۱}{۴}$

$S_{کل} = \frac{۱}{۴} + \frac{۱}{۲} + \frac{\sqrt{۳}}{۴} = \frac{۳+\sqrt{۳}}{۴}$

$A(\frac{۱}{۲}, \frac{\sqrt{۳}}{۲})$

$B(-\frac{\sqrt{۳}}{۲}, \frac{۱}{۲})$

$C = (۰, -۱)$

ب)

$AB = \sqrt{(\frac{۱+\sqrt{۳}}{۲})^۲ + (\frac{\sqrt{۳}-۱}{۲})^۲} = \sqrt{\frac{۸}{۴}} = \sqrt{۲}$

$AC = \sqrt{(\frac{۱}{۲})^۲ + (\frac{\sqrt{۳}+۲}{۲})^۲} = \sqrt{\frac{۸+۴\sqrt{۳}}{۴}} = \sqrt{۲+\sqrt{۳}}$

$BC = \sqrt{\frac{۳}{۴} + (\frac{۱}{۲}+۱)^۲} = \sqrt{\frac{۳}{۴} + \frac{۹}{۴}} = \sqrt{۳}$

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

PAYCO

DATE :

$AC = \log_{\sqrt{3}}^{12} = \log_{3}^{6} = 6\log_{3}^{2}$ -٤

$BC = \log_{2}^{27} = \log_{2}^{3^3} = 3\log_{2}^{3} = \frac{3}{\log_{3}^{2}}$

$S_{\hat{ABC}} = \sin\hat{A} \times \frac{1}{2} \times AB \times AC = 6\log_{3}^{2} \times \frac{3}{\log_{3}^{2}} \times \frac{1}{2} \times \sin 30 =$

$S_{\hat{ABC}} = \frac{1}{2} \times \frac{1}{2} \times 6 \times 3 < 3$

$x - \cos\alpha = 0 \longrightarrow x = \cos\alpha$ -ب

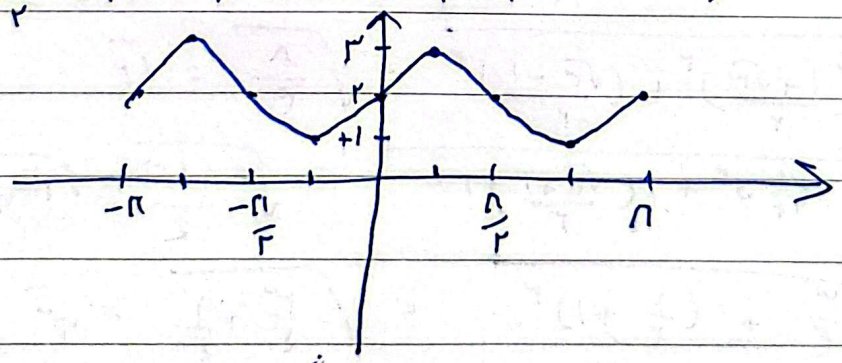
$2\cos^4\alpha - \cos^2\alpha - \sin^2\alpha(2\sin^2\alpha - 1) = \cos^2\alpha(2\cos^2\alpha - 1) +$

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

$\cos^2\alpha + \sin^2\alpha < 1 \longrightarrow \sin 2\alpha = 0$

ا) $-2\sin\alpha\cos\alpha + 2 = -\sin 2\alpha + 2 \quad [-\pi, \pi]$ -ج

$T = \frac{2\pi}{2} = \pi$, $max = |-1| + 2 < 3$, $Min = -|-1| + 2 = 1$

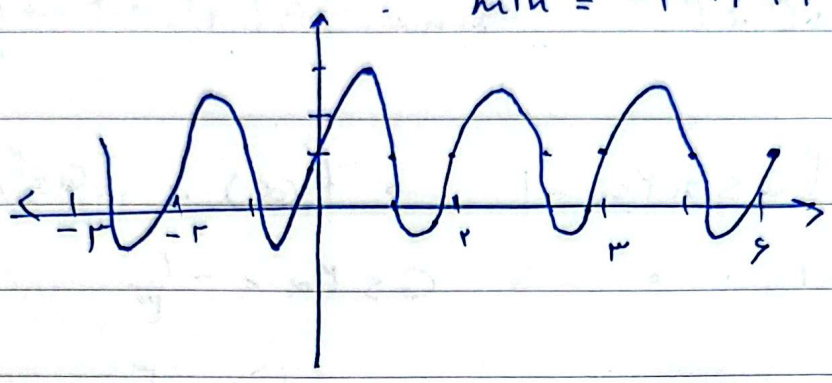


$\rightarrow) \; 2\cos\left(x+\frac{1}{2}\right)\pi + 1 = 2\cos\left(\frac{\pi}{2}+\pi x\right)+1$

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

$T = \frac{2\pi}{\pi} = 2 \longrightarrow max = |-2|+1 = 3$

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



$f(x) = a + b\sin(\pi x).\cos(\pi x).\cos(2\pi x) = -1$

$a + \frac{b}{2}\sin(2\pi x).\cos(2\pi x) = a + \frac{b}{4}\sin(4\pi x)$

$T = \frac{2\pi}{4} = \frac{\pi}{2} = \frac{4\pi}{8} = \frac{2\pi}{4} = \frac{2\pi}{c} \longrightarrow c = 4$

$min = a - \left|\frac{b}{4}\right| = 0 \longrightarrow a = \left|\frac{b}{4}\right| \longrightarrow ab > 0$

$max = a + \left|\frac{b}{4}\right| = 3 \longrightarrow 2a < 4 \longrightarrow a = 2$

$\frac{b}{4} = 1 \rightarrow b = 4$

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

$f(x) = a\cos bx + c$ -9

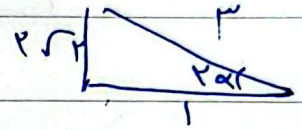
$T = \frac{2\pi}{b} = \pi \rightarrow b = 2$

$max = |a| + c = 2 \qquad min = -|a| + c = -4 \rightarrow c = -1$
$a = -3$

$f(x) = -3\cos x^2 - 1 \rightarrow f(\alpha) = -3\cos^2\alpha - 1 < 0$

$-3\cos 2\alpha - 1 < 0 \rightarrow \cos 2\alpha < -\frac{1}{3}$

$|\tan 2\alpha| = 2\sqrt{2}$



$y = f(x) = f(x \pm T)$ -10

$f(-24, 0) = f(x - 33) \rightarrow x - 33 = -24, 0$ → $f(1, 0)$

$f(1, 0) = -\frac{1}{2}x + 1$

$f(1, 0) = -\frac{1}{2}\left(\frac{33}{2}\right) + 1 = -\frac{33}{4} + 1 = \frac{1}{4} = 0.25$