نام و نام خانوادگی آرش سلطانی ۱۷ پاسخنامه تشریحی تکلیف شماره ۱۴ کلاس دوازدهم پسر A

$\sin\alpha = \frac{OT}{OB} = \frac{1}{OB}$ $\quad AB = OB - OA = \frac{1}{\sin\alpha} - 1 = \frac{1-\sin\alpha}{\sin\alpha}$ ✓ ۲

مساحت مثلث‌های ABD و ADC ارتفاع‌های برابر و قاعده‌های روی دو پاره‌خط عمود است:

$$\frac{S_{ABD}}{S_{ADC}} = 2 = \frac{\frac{1}{2} AD \times AB \times \frac{\sqrt{2}}{2}}{\frac{1}{2} AD \times AC \times \frac{1}{2}} = 2 = \sqrt{2}\frac{AB}{AC} \rightarrow \frac{AB}{AC} = \frac{2}{\sqrt{2}} = \sqrt{2}$$ ✓ ۲

الف) $A\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right), B\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right), C(0,-1)$

$\frac{1}{2} \times \frac{\sqrt{3}}{2}$, $-\frac{\sqrt{3}}{2} \times \frac{1}{2}$, 0×-1, $\frac{1}{2} \times \frac{\sqrt{3}}{2}$ ✓ بدون کفش

$$S_{ABC} = \left|\frac{1+2\sqrt{3}}{4}\right| - \left(-\frac{1}{4}\right) = \frac{2+\sqrt{3}}{4}$$ ✓ ۲

ب) $A\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right), B\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right), C(0,-1)$ ✓

$$\overline{AB} = \sqrt{\Delta x_{AB}^2 + \Delta y_{AB}^2} = \sqrt{\left(\frac{\sqrt{3}+1}{2}\right)^2 + \left(\frac{1-\sqrt{3}}{2}\right)^2} = \sqrt{2}$$

$$\overline{AC} = \sqrt{\Delta x_{AC}^2 + \Delta y_{AC}^2} = \sqrt{\left(\frac{1}{2}-0\right)^2 + \left(\frac{\sqrt{3}+2}{2}\right)^2} = \sqrt{2+\sqrt{3}}$$

$$\overline{BC} = \sqrt{\Delta x_{BC}^2 + \Delta y_{BC}^2} = \sqrt{\left(-\frac{\sqrt{3}}{2}-0\right)^2 + \left(\frac{1}{2}-(-1)\right)^2} = \sqrt{3}$$

$$\Rightarrow P = \overline{AB} + \overline{BC} + \overline{AC} = \sqrt{2} + \sqrt{3} + \sqrt{2+\sqrt{3}}$$ ✓

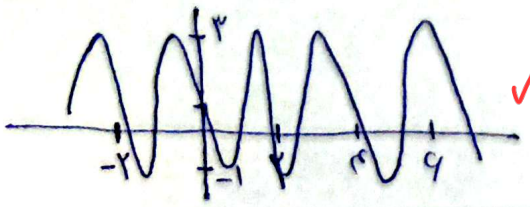
$x = \cos\alpha \rightarrow 2\cos^3\alpha - \cos^2\alpha - \sin^2\alpha(2\sin^2\alpha - 1) = \cos^2\alpha(\underbrace{2\cos^2\alpha - 1}_{\cos 2\alpha}) - \sin^2\alpha(\underbrace{2\sin^2\alpha - 1}_{-\cos 2\alpha})$

$$\rightarrow \cos^2\alpha\cos 2\alpha + \sin^2\alpha\cos 2\alpha = \cos 2\alpha(\cos^2\alpha + \sin^2\alpha) = \cos 2\alpha = 1$$ ✓ ۲

سوال ۵ $\quad \cos^2 2\alpha + \sin^2 2\alpha = 1 \rightarrow \sin^2 2\alpha = 0 \rightarrow \sin 2\alpha = 0$ ✓

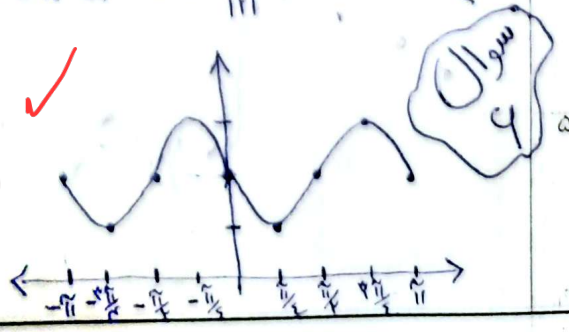
الف) $y = -2\sin(\pi x) + 1 \rightarrow T = \frac{2\pi}{|\pi|} = 2$

$x \in [-\pi, 2\pi] \xrightarrow{\pi = 3.14} x \in [-3.14, 6.28]$

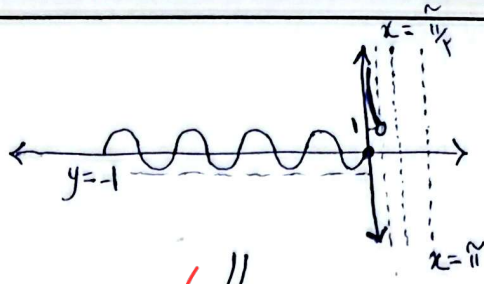


ب) $y = -\sin 2x + 2 \rightarrow T = \frac{2\pi}{|1|} = \pi$ ✓ ۲

سوال ۶



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



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سوال ۷

$R_f=[-1,+\infty)$ ✓

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

$\rightarrow a=\frac{y_{max}+y_{min}}{2}=\frac{4+0}{2}=2$ ✓ / $T=\frac{2\pi}{|4c|}=\frac{2\pi}{4c}=\frac{2\pi}{5}\rightarrow c=\frac{5}{4}$ ۲

$\Rightarrow f(x)=\frac{b}{4}\sin 5x+2 \xrightarrow{(\frac{\pi}{10},4)} 4=\frac{b}{4}+2\rightarrow b=8$ ✓ سوال

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

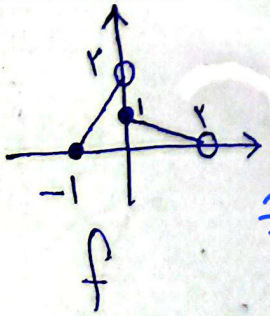
سوال ۴ ✓ ۲

$f(x)=a\cos bx+c \rightarrow c=\frac{y_{max}+y_{min}}{2}=\frac{2-4}{2}=-1$ $\quad b=2$

$\rightarrow |a|=\frac{y_{max}-y_{min}}{2}=\frac{2-(-4)}{2}=3$ نوزاد نوزاد $\rightarrow a=-3$

$T=\pi \rightarrow \alpha=T+\frac{T}{4}\rightarrow \alpha=\frac{5\pi}{4}\rightarrow 2\alpha=\frac{5\pi}{2}\rightarrow \tan 2\alpha=+\infty$

$\cos 2\alpha=-\frac{1}{3}$ $\quad |\tan 2\alpha|=2\sqrt{2}$ ۱



$f(-2\pi,0)=f(-2\pi+1,0)=f(1,0)$

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

$\rightarrow f(1,0)=\frac{1}{2}$

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