نام و نام خانوادگی ....امیرعلی تنهایی راد.... پاسخنامه تشریحی تکلیف شماره ....۲۷.... کلاس دوازدهم پسر B ....

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$f(0^+) = \cos^3(0^+) + b = 0 \rightarrow 1+b=0 \rightarrow b=-1$

$f'(x) = -6\cos^2 2x \times \sin 2x + 2ax$

$\lim_{x\to 0} \frac{f'(x)}{x} = 2 \rightarrow \lim_{x\to 0} \frac{f''(x)}{1} = 2 \rightarrow f''(0) = 2 \rightarrow f''(x) = 24\cos 2x \times -6\cos^2 2x + 2a$

$f''(0) = 2 \times -6 + 2a = 2 \rightarrow \boxed{a=7}$

$a+b=6$

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$y' = 2x \qquad 2\alpha \times 2\beta = -1 \rightarrow 4\alpha\beta = -1 \rightarrow \alpha\beta = \frac{-1}{4}$

نقاط برخورد α, β

$f(\alpha) = f(\beta) \Rightarrow \alpha^2 - 1 = \beta^2 - 1 \rightarrow \alpha^2 - \beta^2 = 0 \rightarrow (\alpha-\beta)(\alpha+\beta) = 0 \rightarrow \begin{cases} \alpha = \beta \times \\ \alpha = -\beta \end{cases}$

$-\beta^2 = \frac{-1}{4} \rightarrow \beta^2 = \frac{1}{4} \rightarrow \begin{cases} \beta = \frac{1}{2} \rightarrow \frac{-3}{4} \\ \alpha = \frac{-1}{2} \rightarrow \frac{-3}{4} \end{cases} \rightarrow \frac{-3}{4} + \frac{-3}{4} = \frac{-6}{4} = -1.5$

۳

$\begin{vmatrix} 2.5 \\ 6 \end{vmatrix} \quad \begin{vmatrix} -0.5 \\ -12 \end{vmatrix} \quad m = \frac{18}{3} = 6 \qquad y = 6x - 9$

$\frac{a}{2x-1} = 6x - 9 \rightarrow a = 12x^2 - 24x + 9 \rightarrow 12x^2 - 24x + 9 - a = 0$

$\Delta = 0 \rightarrow (24)^2 - 4(12)(9-a) = 576 - 432 + 48a = 0 \rightarrow a = -3 \qquad f(5) = \frac{-3}{9} = \frac{-1}{3}$

۴

$y' = \frac{1-a^2}{(ax+1)^2} \xrightarrow{x=1} \frac{(1-a)(1+a)}{(a+1)(a+1)} = \frac{1-a}{a+1} = 2 \rightarrow 2 + 2a = 1 - a \rightarrow$

$3a = -1 \rightarrow a = \frac{-1}{3} \qquad y = \frac{x - \frac{1}{3}}{\frac{-1}{3}x + 1} \xrightarrow{x=1} y = 1$

$2(1) + b = 1 \rightarrow b = -1 \qquad a - b = \frac{-1}{3} - (-1) = \frac{2}{3}$

۵

$\sin x + \frac{1}{2}\cos x = \frac{3}{2}\sin x \rightarrow \frac{1}{2}\sin x = \frac{1}{2}\cos x \rightarrow \sin x = \cos x \rightarrow x = \frac{\pi}{4}$

$f'(x) = \cos x - \frac{1}{2}\sin x \rightarrow f'(\frac{\pi}{4}) = \frac{\sqrt{2}}{2} - \frac{1}{2} \times \frac{\sqrt{2}}{2} = \frac{2\sqrt{2}}{4} - \frac{\sqrt{2}}{4} = \frac{\sqrt{2}}{4}$

$f(\frac{\pi}{4}) = \frac{\sqrt{2}}{2} + \frac{1}{2} \times \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{4} = \frac{3\sqrt{2}}{4}$

$y = \frac{\sqrt{2}}{4}x + b \xrightarrow{x=\frac{\pi}{4}} \frac{3\sqrt{2}}{4} = \frac{\sqrt{2}}{4} \times \frac{\pi}{4} + b \rightarrow \frac{3\sqrt{2}}{4} = \frac{\sqrt{2}\pi}{16} + b \rightarrow b = \frac{12\sqrt{2} - \sqrt{2}\pi}{16}$

$0 = \frac{\sqrt{2}}{4}x + b \rightarrow -b = \frac{\sqrt{2}}{4}x \rightarrow b = -\frac{\sqrt{2}}{4}x \rightarrow x = \frac{-4b}{\sqrt{2}} = \frac{-4\sqrt{2}(12-\pi)}{\sqrt{2} \times 16} = \frac{12-\pi}{-4} = \frac{\pi - 12}{4}$

6

$f'(x)=6x^2-6x-12$

$6x^2-6x-12=0 \longrightarrow x^2-x-2=0 \longrightarrow (x-2)(x+1)=0 \Longrightarrow A\Big|^{2}_{-19} \quad B\Big|^{-1}_{8}$

$m_{AB}=\dfrac{27}{-3}=-9$

$6x^2-6x-12=-9 \longrightarrow 6x^2-6x-3=0 \longrightarrow AC<0$ دو ریشه دارد $\longrightarrow \underline{2}$

7

$\dfrac{-b}{3a}<0 \longrightarrow \dfrac{-(K+1)}{3K}<0$ $\quad$ $\begin{array}{c|c|c} & -1 \quad\quad 0 & \\ - & + & - \end{array}$ $\quad I = (-\infty,-1)$ I به ازای K های منفی

$K\times\dfrac{-(K+1)^3}{27K^3}+(K+1)\times\dfrac{(-(K+1))^2}{9K^2}=\dfrac{-(K+1)^3}{27K^2}+\dfrac{(K+1)^3}{9K^2}=\dfrac{2(K+1)^3}{27K^2}>0$

$\begin{array}{c|c|c} & -1 \quad\quad 0 & \\ - & + & + \end{array}$ $\quad II\ (-1,0)$ برای K های منفی $\quad I\cap II=\varnothing$ تهی $\longrightarrow$ هیچ مقدار

8

9

$f(0)=4 \longrightarrow c=4 \qquad f'(x)=3x^2+2ax+b \longrightarrow f'(0)=0 \longrightarrow b=0$

$f'(x)=3x^2+2ax=0 \longrightarrow x(3x+2a)=0 \longrightarrow 3x+2a=0 \longrightarrow 3x=-2a \rightarrow x=\dfrac{-2a}{3}$

$\dfrac{-8a^3}{27}+\dfrac{4a^3}{9}+4=\dfrac{12a^3-8a^3}{27}+4=0 \longrightarrow \dfrac{4a^3}{27}=-4 \longrightarrow \dfrac{a^3}{27}=-1$

$a=-3 \qquad x=\dfrac{-2a}{3}=\dfrac{-2\times-3}{3}=2$

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$f'(x)=4x^3-12x=4x(x^2-3)=0 \begin{cases} x=0 \\ x=\sqrt{3} \\ x=-\sqrt{3} \end{cases}$ $\quad \begin{array}{c|c|c|c} & -\sqrt{3} \quad\quad 0 & \quad\quad \sqrt{3} & \\ - & + & - & + \end{array}$

$f''(x)=12x^2-12=12(x^2-1)=0 \begin{cases} x=1 \\ x=-1 \end{cases}$ $\quad \begin{array}{c|c|c} & -1 \quad\quad 1 & \\ + & - & + \end{array}$ $\quad A\Big|^{-\sqrt{3}}_{-4} \quad B\Big|^{\sqrt{3}}_{-4}$

$C\Big|^{-1}_{0} \quad D\Big|^{+1}_{0} \qquad m_{AB}=m_{CD} \longrightarrow \underline{\text{موازی}}$