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نام و نام خانوادگی ...امیرعلی تنهایی یاد... پاسخنامه تشریحی تکلیف شماره ...۲۷... کلاس دوازدهم پیش B...

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

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

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

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

$a+b=6$

(۲)

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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 تقاطع α, β

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

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

(۲)

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

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

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

(۲)

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

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

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

(۲)

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

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

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

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

(۲)

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

$f'(x) = 4x^2 - 4x - 12$

$4x^2 - 4x - 12 = 0 \longrightarrow x^2 - x - 2 = 0 \longrightarrow (x-2)(x+1) = 0 \Longrightarrow A\Big|_{-19}^{2} \quad B\Big|_{8}^{-1}$ ۶

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

$4x^2 - 4x - 12 = -9 \rightarrow 4x^2 - 4x - 3 = 0 \rightarrow AC < 0$ دو ریشه دارد — ۲ ۲

$\frac{-b}{3a} < 0 \longrightarrow \frac{-(k+1)}{3k} < 0$ $\quad \begin{array}{c|c|c} & -1 & 0 \\ - & + & - \end{array}$ $\quad I = (-\infty, -1) \quad I$ بازه طول عطف منفی

$k \times \frac{-(k+1)^3}{27k^3} + (k+1) \times \frac{(-(k+1))^2}{9k^2} = \frac{-(k+1)^3}{27k^2} + \frac{(k+1)^3}{9k^2} = \frac{2(k+1)^3}{27k^2} > 0$ ۷

$\begin{array}{c|c|c} & -1 & 0 \\ - & + & + \end{array}$ $\quad II\ (-1, 0)$ بازه عرض منفی $\quad I \cap II = \varnothing$ تهی $\longrightarrow$ هیچ مقداری — ۲

طول عطف $x = \frac{-b}{3a} = \frac{-a}{3} \rightarrow x = -\frac{a}{3} \rightarrow \frac{-a}{3} = -1 \rightarrow a = 3$

$f(-1) = -4 \rightarrow -1 + 3 - b - 1 = -4 \rightarrow b = -5$ $\quad \Big\} \quad \frac{a}{b} = \frac{3}{5}$ ۸

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

$f'(x) = 3x^2 + 2ax = 0 \longrightarrow x(3x + 2a) = 0 \longrightarrow 3x + 2a = 0 \longrightarrow 3x = -2a \rightarrow x = \frac{-2a}{3}$ ۹

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

$a = -3 \qquad x = \frac{-2a}{3} = \frac{-2 \times -3}{3} = 2$ — ۲

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

$f''(x) = 12x^2 - 12 = 12(x^2 - 1) = 0 \begin{cases} x = 1 \\ x = -1 \end{cases}$ $\quad \begin{array}{c|c|c} & -1 & 1 \\ + & - & + \end{array}$ $\quad A\Big|_{-4}^{-\sqrt{3}} \quad B\Big|_{-4}^{\sqrt{3}}$ ۱۰

$C\Big|_{0}^{-1} \quad D\Big|_{0}^{+1} \qquad m_{AB} = m_{CD} \longrightarrow$ موازی — ۲