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نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

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$$\lim_{x\to 0^+} \frac{f(x)}{x} = 0 \Rightarrow \lim_{x\to 0^+} \frac{\cos^3(2x) + ax^2 + b}{x} \overset{0/0}{\Rightarrow} b = -1$$

$$\lim_{x\to 0^+} \frac{f'(x)}{x} = \lim_{x\to 0^+} \frac{-6\sin(2x)\cos^2(2x) + 2ax}{x} \underset{\text{Hop}}{\overset{0/0}{\Rightarrow}} 6(2\cos 2x - 6\sin^2(2x)\cos 2x) + 2a$$

$a = -6$ $\quad a + b = -7$

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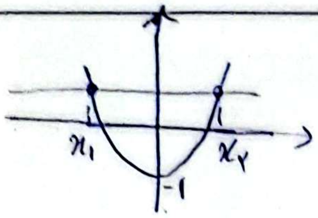

$f'(x) = 2x$

$2x_1 \times 2x_2 = 4x_1 x_2 = -1 \quad x_1 \times x_2 = -\frac{1}{4}$

$x_1 = -\frac{1}{2} \Rightarrow y_1 = -\frac{3}{4}$

$x_2 = \frac{1}{2} \Rightarrow y_2 = -\frac{3}{4}$

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d شیب $m = \frac{18}{3} = 6 \quad d \Rightarrow y + 12 = 6(x + \frac{1}{2}) \Rightarrow y = 6x - 9$

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

$\Delta = 4 - 4\left(\frac{9-a}{12}\right) = \dots = 0 \quad a = 7$

$f(x) = \frac{7}{2x-1} \quad f(x) = \frac{7}{9}$

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$$y' = \frac{ax + 1 - a(x+a)}{(ax+1)^2} = \frac{1-a^2}{(ax+1)^2} \longrightarrow f'(1) = 2 = \frac{1-a^2}{(a+1)^2} \Rightarrow 2a^2 + 4a + 2 - 1 + a^2 = 0$$

$3a^2 + 4a + 1 = 0 \quad a \begin{cases} -1 & ✗ \\ -\frac{1}{3} & ✓ \end{cases} \quad y = \frac{x - \frac{1}{3}}{-\frac{1}{3}x + 1} \Rightarrow f(1) = \frac{\frac{2}{3}}{\frac{2}{3}} = 1 = 2 + b$

$b = -1$

$a - b = -\frac{1}{3} + 1 = \frac{2}{3}$

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$\frac{3}{2}\sin x = \sin x + \frac{1}{2}\cos x \Rightarrow \frac{1}{2}(\sin x - \cos x) = 0$

$x = \frac{\pi}{4} \quad \left| \begin{matrix} \frac{\pi}{4} \\ \frac{3\sqrt{2}}{4} \end{matrix} \right.$

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

$d \Rightarrow y - \frac{3\sqrt{2}}{4} = \frac{\sqrt{2}}{4}\left(x - \frac{\pi}{4}\right) \Rightarrow \frac{\sqrt{2}}{4}x - \frac{\sqrt{2}\pi}{16} + \frac{12\sqrt{2}}{16} = 0$

$$\frac{\sqrt{2}(\pi - 12)}{16}$$

$f'_{(x)} = 6x^2 - 6x - 12$ $\begin{array}{c|c|c|c} & -1 & & 2 \\ f'_{(x)} & + & - & + \\ f_{(x)} & \nearrow & \searrow & \nearrow \\ & \text{Max} & & \text{min} \end{array}$ $\begin{vmatrix} -1 \\ 8 \end{vmatrix}$ $\begin{vmatrix} 2 \\ -19 \end{vmatrix}$ $m_{AB} = \frac{8-(-19)}{-1-2} = -9$ $6x^2 - 6x - 12 + 9 \Rightarrow 2x^2 - 2x - 1$ $\Delta > 0 \Rightarrow$ ۲ نقطه موازی در منحنی وجود دارد AB	۶
$\frac{-b}{3a} = \frac{-1-k}{3k} < 0$ $\begin{array}{c|c|c} & -1 & 0 \\ - & + & - \end{array}$	۷
$y' = 3x^2 + 2ax + b$ $x=-1 \Rightarrow f_{(-1)} = -1 + a - b - 1 = -4$ $a - b = -2$	۸
$f'_{(x)} = 3x^2 + 2ax + b$, $b = 0$ $(0,0)$ $(0,4) \Rightarrow c = 4$ $f_{(x)} = x^3 + ax^2 + 4$ $f'_{(x)} = 3x^2 + 2ax$ $x(3x+2a)$ $x < 0$, $-\frac{2a}{3}$ $(\beta, 0) \Rightarrow f_{(x)} = -\frac{8a^3}{27} + \frac{4a^3}{9} + 4$ $(\beta, 0) \Rightarrow f'_{(x)}$ $\frac{4a^3}{27} = -4$ $a = 3$ طول نقطه $= +2$	۹
$f'_{(x)} = 4x^3 - 12x = 4x(x^2 - 3)$ $\begin{array}{c|c|c|c|c} & -\sqrt{3} & 0 & \sqrt{3} & \\ - & + & - & + \\ \searrow & \nearrow & \searrow & \nearrow \\ & \text{min} & \text{Max} & \text{Min} \end{array}$ $\begin{vmatrix} -\sqrt{3} \\ -4 \end{vmatrix}$ $\begin{vmatrix} \sqrt{3} \\ -4 \end{vmatrix}$ دو خط موازی اند زاویه بین صفر $f'' = 12x^2 - 12$ $\begin{array}{c|c|c} -1 & & +1 \\ + & - & + \\ \cup & \cap & \cup \end{array}$ $\begin{vmatrix} -1 \\ 0 \end{vmatrix}$ $\begin{vmatrix} +1 \\ 0 \end{vmatrix}$	۱۰