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نکته

19, 19, 19

$$\lim_{x \rightarrow 0^+} \frac{f(x)}{x} = \lim_{x \rightarrow 0^+} f'(x) = \lim_{x \rightarrow 0^+} f'(x) = 4 \cos^2(x) \sin(x) + 4 \cos(x) = 4(1 - \frac{1}{2}) + 4 = 4$$

$$\Rightarrow -12x + 2 \epsilon m^2 + 4a = 0$$

$$\lim_{x \rightarrow 0} \frac{f'(x)}{x} = \frac{-12x + 2 \epsilon m^2 + 4a}{x} = 2 \epsilon m^2 + 4a - 12 = 4 \Rightarrow a = \frac{1}{2}$$

$$C \cdot \sin^2(x) + \sqrt{m} + b = 0 \Rightarrow 1 + b = 0 \Rightarrow b = -1$$

(1)

$$f(x) = m^2 \cdot 1 \Rightarrow f'(x) = 2m \frac{x_0 - x}{a, \frac{1}{a}} \Rightarrow 2m = a \Rightarrow a = \pm \frac{1}{2}, a = \pm 1$$

(2)

$$\left. \begin{aligned} f'(x) = f'(\frac{1}{r}) = -\frac{r}{x} \\ f'(x) = f'(\frac{1}{r}) = -\frac{r}{x} \end{aligned} \right\} \Rightarrow y_1 + y_2 = -\frac{r}{x}$$

(3)

$$f'(x) = \frac{a}{x^{m-1}} \Rightarrow y = mx + b \Rightarrow m = \frac{4 - (-12)}{10 - (-10)} = \frac{16}{20} = \frac{4}{5} \Rightarrow y = \frac{4}{5}x + b \Rightarrow b = -9$$

(4)

$$L \rightarrow f'(x) = m \Rightarrow m = \frac{-a}{(1-x)^2} \Rightarrow 4 = \frac{-a}{(1-x)^2} \Rightarrow f(x) = y \Rightarrow \frac{a}{1-x} = 4x - 9 \Rightarrow a = (4x - 9)(1-x)$$

$$\Rightarrow \epsilon m^2 - 12m + 4a = 0 \Rightarrow \epsilon m^2 - 12m + 4 \cdot \frac{a}{\mu} = 0 \Rightarrow 4\epsilon - 14(1 - \frac{a}{\mu}) = 0$$

(5)

$$f(x) = \frac{-r}{(x-1)^2} = \frac{-r}{4} = -\frac{1}{\mu} \Rightarrow 4\epsilon - 14 + 14 \frac{a}{\mu} = 0 \Rightarrow 14 - 14 \frac{a}{\mu} = 0 \Rightarrow a = \mu$$

$$f(x) = \frac{a+a}{a^{n+1}} = 1 \Rightarrow f(1) = \frac{1+a}{a+1}, h(x) = \sqrt{a+b} \Rightarrow h(1) = \sqrt{1+b}, h(1) = f(1)$$

$$\Rightarrow \sqrt{a+b} = 1 \Rightarrow b = 1, f'(x) = \frac{(1-a^r)}{(a^{n+1})^r} = r \Rightarrow \frac{1-a^r}{(1+a)^r} = r \Rightarrow 1-a^r = r(1+a)^r$$

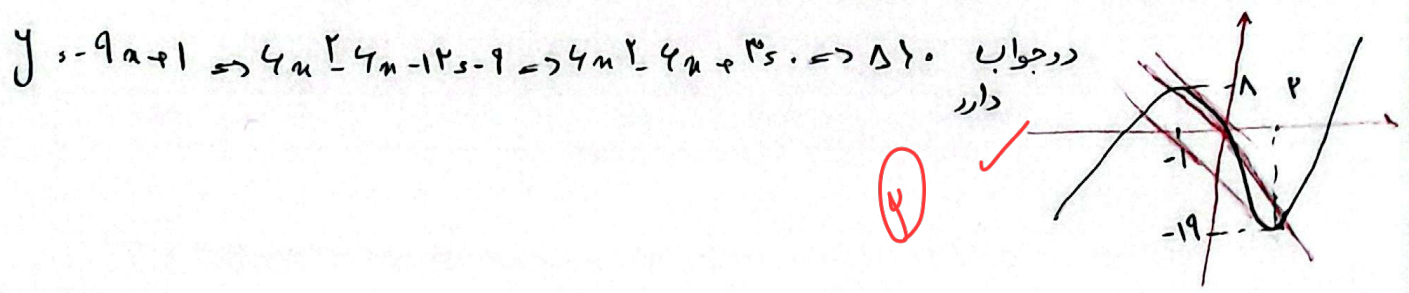
$$\Rightarrow r a^r + \epsilon(a+1) = 0 = (a+1)(r a + 1) \Rightarrow a = -\frac{1}{r}, b = 1 \Rightarrow a - b = -\frac{1}{r} - 1$$

(6)

$f(x) = \sin x + \frac{1}{2} \cos x$, $g(x) = \frac{1}{2} \sin x \Rightarrow \sin x + \frac{1}{2} \cos x = \frac{1}{2} \sin x$ (1, Va)

$\Rightarrow \frac{1}{2} \cos x = \frac{1}{2} \sin x \Rightarrow x = \frac{\pi}{4}$, $f'(x) = \cos x - \frac{1}{2} \sin x \Rightarrow f'(\frac{\pi}{4}) = \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{4} = \frac{\sqrt{2}}{4}$
 $\Rightarrow \frac{\sqrt{2}}{4} \Rightarrow f(\frac{\pi}{4}) = \frac{\sqrt{2}}{4} \Rightarrow y - \frac{\sqrt{2}}{4} = \frac{\sqrt{2}}{4} (x - \frac{\pi}{4}) \Rightarrow y = \frac{\sqrt{2}}{4} x - \frac{\sqrt{2}}{14} + \frac{\sqrt{2}}{4} = \frac{\sqrt{2}}{4} x - \frac{\sqrt{2}}{14}$

$f(x) = 2x^2 - 4x + 1 \Rightarrow f'(x) = 4x - 4 = 0 \Rightarrow x = 1$, $f''(x) = 4 > 0$



$f(x) = Kx^2 + (K+1)x \Rightarrow f'(x) = 2Kx + (K+1) \Rightarrow f''(x) = 2K$

$\Rightarrow 4Kx + 2K + 1 = 0 \Rightarrow x = -\frac{(K+1)}{2K}$ $\begin{cases} K > 0 \\ K < -1 \end{cases}$

$f''(x) > 0 \Rightarrow K \left(\frac{-(K+1)}{2K} \right)^2 + (K+1) \left(\frac{-(K+1)}{2K} \right) > 0 \Rightarrow \frac{-(K+1)^2}{4K} + \frac{-(K+1)^2}{2K} > 0 \Rightarrow \frac{-(K+1)^2}{4K} > 0$

$\Rightarrow (K+1)^2 > 0 \Rightarrow K+1 > 0 \Rightarrow K > -1$ $\textcircled{2} \text{ و } \textcircled{1} \rightarrow K > 0$ بازای هیچ حدی

$y = x^2 + ax + b \Rightarrow y' = 2x + a \Rightarrow y'' = 2$ $f'(-1) = 0 \Rightarrow -2 + a = 0$

$\Rightarrow a = 2$, $f(-1) = -1 \Rightarrow -1 + 2b - 1 = -1 \Rightarrow b = 1 \Rightarrow \frac{a}{b} = \frac{2}{1}$

$f(x) = ax^2 + bx + c \Rightarrow f'(x) = 2ax + b \Rightarrow f'(0) = 0 \Rightarrow b = 0$ و $f(0) = c = \epsilon$

$f(x) = a(x^2 + \frac{2a}{a}) \Rightarrow \begin{cases} a > 0 \\ a = -\frac{2a}{a} \end{cases} \Rightarrow f(-\frac{2a}{a}) \Rightarrow \frac{-1a^2}{2a} + \frac{\epsilon a^2}{a} + \epsilon = 0$
 $\Rightarrow \frac{\epsilon a^2}{2a} = -\epsilon \Rightarrow a^2 = -2 \Rightarrow a = \pm \sqrt{2}$ \min $\frac{2a}{a} = \frac{2}{1}$

$f(x) = ax^2 + bx + c \Rightarrow f'(x) = 2ax + b = \epsilon m (m^2 - 1) = 0 \Rightarrow a = 0$ و $\pm \sqrt{2}$

a	$-\sqrt{2}$	0	$\sqrt{2}$
f'	$-$	$+$	$-$
f''	\searrow	\nearrow	\searrow

$\Rightarrow \min$ $-\sqrt{2}$ و $\sqrt{2}$ $m_{AB} = 0 \Rightarrow f(a) = 2a^2 - 1 = 0$
 $\Rightarrow a = \pm 1 \Rightarrow C \begin{vmatrix} 1 & 1 \\ 0 & 1 \end{vmatrix} P \begin{vmatrix} 1 & 1 \\ 0 & 1 \end{vmatrix}$