

۱۷

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

$$f'(0) = 0 \rightarrow \frac{3 \cos^2(2x) \times (-\sin 2x) \times 2 + 2ax}{1 - 4x^2} = 2$$

$$= \frac{3 \left(1 - \frac{8x^2}{2}\right) \times (-2x) \times 2 + 2ax}{x} = \frac{48x^3 - 12x + 2ax}{x} = 2$$

۱۱۵

$$f'(x) = 2x$$

$$f'(x_1) = 2x_1 = m \rightarrow x_1 = \frac{m}{2}$$

$$f'(x_2) = 2x_2 = -\frac{1}{m} \rightarrow x_2 = -\frac{1}{2m}$$

$$f(x_1) = f(x_2) \rightarrow \frac{m^2}{4} = \frac{1}{4m^2} \rightarrow 4m^4 = 4 \rightarrow m = \pm 1 \rightarrow \left. \begin{matrix} x_1 = \frac{1}{2} \\ x_2 = -\frac{1}{2} \end{matrix} \right\} 2f(x) = -\frac{3}{2}$$

$$m = \frac{6 - (-12)}{2 \cdot 5 - (-0.15)} = \frac{18}{3} = 6 \rightarrow y = 6x - 9$$

$$f(x) = \frac{-3}{2x-1} \quad x = \frac{5}{2} \rightarrow -\frac{1}{3}$$

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

$$4x^2 - 4x + 1$$

$$f(x) = \frac{a}{2x-1} = 6x-9 \Rightarrow (a = 12x^2 - 24x + 9) \times 2$$

$$48x^2 - 72x + 24 = 0 \rightarrow 2x^2 - 3x + 1 = 0 \rightarrow \left. \begin{matrix} x = 1 \rightarrow a = -3 \\ x = \frac{1}{2} \rightarrow \text{O.O.E} \end{matrix} \right\}$$

$$f'(a) = \frac{1-a^2}{(a+1)^2} \rightarrow \frac{1-a^2}{(a+1)^2} = \frac{(1+a)(1-a)}{(a+1)^2} = 2 \rightarrow 2a+2 = 1-a \rightarrow 3a = -1 \rightarrow a = -\frac{1}{3}$$

$$f(x) = \frac{x - \frac{1}{3}}{-\frac{1}{3}x + 1} \quad x = 1 \rightarrow \frac{\frac{2}{3}}{\frac{2}{3}} = 1 = 2 + b \rightarrow b = -1$$

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

$$\sin x + \frac{1}{2} \cos x = \frac{3}{2} \sin x \rightarrow \cos x = \sin x \rightarrow \tan x = 1 \rightarrow x \in [0, \pi] \rightarrow x = \frac{\pi}{4}$$

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

$$y = \frac{\sqrt{2}}{4}x + \frac{3\sqrt{2}}{4} - \frac{\pi\sqrt{2}}{16} = 0$$

$$\frac{\sqrt{2}}{4}x = \frac{\pi\sqrt{2}}{16} - \frac{3\sqrt{2}}{4}$$

$$x = \frac{\pi}{4} - 3$$

$$f'(x) = 6x^2 - 6x - 12 = 0 \rightarrow x^2 - x - 2 = 0 \rightarrow \begin{matrix} x = -1 \\ x = 2 \end{matrix} \quad \text{ext}_1 \left| \begin{matrix} -1 \\ 8 \end{matrix} \right. \quad \text{ext}_2 \left| \begin{matrix} 2 \\ -19 \end{matrix} \right.$$

$$m = \frac{8+19}{-1-2} = \frac{27}{-3} = -9$$

$$6x^2 - 6x - 12 = -9 \rightarrow 6x^2 - 6x - 3 = 0 \rightarrow 2x^2 - 2x - 1 = 0$$

المعادلة < 5

6

7

$$f(-1) = -1 + a - b - 1 = -4 \rightarrow a - b = -2$$

$$f'(-1) = 3x^2 + 2ax + b \rightarrow 3 - 2a + b = -4 \rightarrow b - 2a = -7$$

$$\begin{cases} -a = -9 \rightarrow a = 9 \\ b = 11 \end{cases} \quad \frac{a}{b} = \frac{9}{11}$$

10

8

$$f(0) = 4 \rightarrow C = 4$$

$$f'(0) = 0 \rightarrow b = 0$$

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

$$f\left(-\frac{a}{3}\right) = 0 \rightarrow \frac{-8a^3}{27} + \frac{4a^3}{9} + 4 = 0 \rightarrow \frac{4a^3}{27} = -4 \rightarrow a = -3$$

min = 2

9

$$f'(x) = 4x^3 - 12x = 0 \rightarrow x = 0, x = \pm\sqrt{3}$$

$$f''(x) = 12x^2 - 12 = 0 \rightarrow x = \pm 1$$

$M_{AB} = 0$ $M_{CO} = 0$

x	-1	1
y''	+	-
y	U	∩

x	$-\sqrt{3}$	0	$\sqrt{3}$
y'	-	+	-
y	min		min
	-4		-4

10

$$\lim_{n \rightarrow t} \frac{f(n)}{n} = 0 \rightarrow \lim_{n \rightarrow t} \frac{C \cdot s^r(n) + an^r + b}{n} = 0 \rightarrow \lim_{n \rightarrow t} \frac{1+b}{n} = 0 \quad -1$$

$\hookrightarrow \boxed{b = -1}$

$$\lim_{n \rightarrow 0^-} \frac{f'(n)}{n} = 2 = \lim_{n \rightarrow 0^-} \frac{-4 \sin(\pi n) C \cdot s^r(n) + \pi a n}{n} = 2 \quad \xrightarrow{\text{عمادزی}}$$

$$\lim_{n \rightarrow 0^-} \frac{(-4 \times \pi n) + \pi a n}{n} = 2 \rightarrow \pi a - 4\pi = 2 \rightarrow \pi a = 12 \rightarrow \boxed{a = 4}$$

$$a + b = 4 - 1 = 3$$

$$y' = 3kn^r + 2(k+1)n \rightarrow y'' = 4kn + 2(k+1) = 0 \rightarrow n = \frac{k+1}{-3k} \quad \underline{V}$$

$$\frac{-(k+1)}{3k} < 0 \rightarrow \frac{-1}{-1+k} \rightarrow \boxed{k < -1} \text{ و } \boxed{k > 0} \quad \leftarrow \text{نقطه‌ای عطف در همین دام است پس}$$

$$\frac{-(k+1)}{3k} (k) + (k+1) > 0 \rightarrow \frac{-(k+1)}{3} + k+1 > 0 \rightarrow \frac{2k+2}{3} > 0 \rightarrow \boxed{k > -1} \quad \underline{2}$$

$$1 \cap 2 \rightarrow k > 0$$

به ازای هم مقدار k منفر و صحیح جواب ندارد!

$$\text{نقطه عطف} = -\frac{b}{3a} = -\frac{a}{3} \rightarrow n = -\frac{a}{3} \rightarrow \frac{-a}{3} = -1 \rightarrow \boxed{a = 3}$$

$$f(-1) = -2 \rightarrow -1 + 3 - b - 1 = -2 \rightarrow \boxed{b = -5}$$

$$\left. \begin{array}{l} a = 3 \\ b = -5 \end{array} \right\} \frac{a}{b} = \frac{3}{-5}$$