

فره‌شما به دلیل نوتس اسم مندرجاً در کلاس

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

$$\lim_{x \rightarrow 0} \frac{f(x)}{g(x)} = \frac{0}{0} \Rightarrow \lim_{x \rightarrow 0} \frac{f'(x)}{g'(x)} = \lim_{x \rightarrow 0} \frac{-\sin(x)}{\cos(x)} = \frac{-1}{1} = -1$$

$$\lim_{x \rightarrow 0} \frac{f'(x)}{g'(x)} = \frac{-1 + 1 + 2x}{1} = \frac{2x}{1} = 0 \Rightarrow a = 1$$

$$\cos(x) + 1 + 2x \Rightarrow (1 + b = 0 \Rightarrow b = -1) \quad a + b = 0 \quad \checkmark$$

$$f(x) = x^2 - 1 \Rightarrow f'(x) = 2x \quad \frac{x_0 - x}{a_1 - \frac{1}{a}} \quad 2x = a \Rightarrow x = \frac{a}{2}$$

$$f(x_1) = f\left(\frac{1}{2}\right) = -\frac{3}{4} \quad f(x_2) = f\left(\frac{1}{2}\right) = -\frac{3}{4} \Rightarrow y_1 + y_2 = -\frac{3}{2} \quad \checkmark$$

$$y = mx + b \Rightarrow m = \frac{\Delta y}{\Delta x} = \frac{1}{\frac{1}{4}} = 4 \quad y = 4x + b \Rightarrow b = -9 \quad y = 4x - 9$$

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

$$a = 4 \Rightarrow f(x) = \frac{4}{9} = \frac{1}{\frac{9}{4}} \quad \checkmark$$

$$f(x) = \frac{a+1}{a+1} = 1 \quad y = 1 + b \Rightarrow 1 + b = 1 \Rightarrow b = 0$$

$$\frac{1-a^2}{(1+a)^2} = 2 \Rightarrow 1 - a^2 = 2(1+a)^2 \Rightarrow 1 - a^2 = 2(1 + 2a + a^2) \Rightarrow 1 - a^2 = 2 + 4a + 2a^2$$

$$\Rightarrow a = -\frac{1}{2} \quad b = 1 \Rightarrow a - b = -\frac{1}{2} + 1 = \frac{1}{2} \quad \checkmark$$

$4x^2 - 4x - 1 = 0 \Rightarrow x^2 - x - \frac{1}{4} = 0 \quad (x-2)(x+1)$

$y = -9x + 1$

$4x^2 - 4x - 1 = -9x + 1$

$4x^2 + 5x - 2 = 0 \quad \Delta > 0 \Rightarrow$  (دو جواب دارد)

دو نقطه خطی نیز نمودار را قطع می‌کنند

سوال ۱۵

$$f(u) = g(u) \rightarrow \sin u + \frac{1}{\sqrt{e}} \cos u = \frac{\sqrt{e}}{\sqrt{e}} \sin u \rightarrow \sin u = \cos u \rightarrow u = \frac{\pi}{4}$$

$$f\left(\frac{\pi}{4}\right) = \sin\left(\frac{\pi}{4}\right) + \frac{1}{\sqrt{e}} \cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{e}}{\sqrt{e}} + \frac{\sqrt{e}}{\sqrt{e}} = \frac{2\sqrt{e}}{\sqrt{e}}$$

$$f'(u) = \cos u - \frac{1}{\sqrt{e}} \sin u \rightarrow f'\left(\frac{\pi}{4}\right) = \cos\left(\frac{\pi}{4}\right) - \frac{1}{\sqrt{e}} \sin\left(\frac{\pi}{4}\right) = \frac{\sqrt{e}}{\sqrt{e}} - \frac{\sqrt{e}}{\sqrt{e}} = \frac{\sqrt{e}}{\sqrt{e}}$$

$$y - f\left(\frac{\pi}{4}\right) = f'\left(\frac{\pi}{4}\right)(x - \frac{\pi}{4}) \rightarrow y - \frac{2\sqrt{e}}{\sqrt{e}} = \frac{\sqrt{e}}{\sqrt{e}}(x - \frac{\pi}{4}) \xrightarrow{y=0} -\frac{2\sqrt{e}}{\sqrt{e}} = \frac{\sqrt{e}}{\sqrt{e}}(x - \frac{\pi}{4}) \rightarrow x = \frac{\pi}{4} - 2$$

$$y = Kx^{\mu} + (K+1)x^{\nu} \rightarrow y' = \mu Kx^{\mu-1} + \nu(K+1)x^{\nu-1} \rightarrow y'' = \mu(\mu-1)Kx^{\mu-2} + \nu(\nu-1)(K+1)x^{\nu-2} = 0$$

$$x = \frac{-K-1}{\mu K} \xrightarrow{\text{در دو طرف ضرب کنیم}} -\frac{K+1}{\mu K} < 0 \rightarrow \frac{-1}{-1+1} \rightarrow K < -1, K > 0 \text{ (I)} \quad \text{(I) \& (II) } \rightarrow K > 0$$

$$\rightarrow -\frac{K+1}{\mu K} K + K + 1 > 0 \rightarrow -\frac{K+1}{\mu} + K + 1 > 0 \rightarrow \frac{\mu K + \mu}{\mu} > 0 \rightarrow K + 1 > 0 \rightarrow K > -1 \text{ (II)}$$

کدام مقدار صحیح و منطقی است

سوال ۱۶

$$\text{جهت } x = -\frac{b}{\mu a} \rightarrow x = -\frac{a}{\mu} \rightarrow -\frac{a}{\mu} = -1 \rightarrow a = \mu$$

$$\frac{a}{b} = \frac{\mu}{a}$$

$$-1 = -1 + \mu - b - 1 \rightarrow b = 2$$

سوال ۱۷

$$f(x) = x \rightarrow (x)^{\mu} + a(x) + b(x) + c = x \rightarrow c = x$$

$$f'(x) = \mu x^{\mu-1} + a + b \rightarrow f'(x) = 0 \rightarrow f'(x) = \mu(x)^{\mu-1} + a + b = 0 \rightarrow b = 0$$

$$f(x) = x^{\mu} + ax + x \rightarrow f'(x) = \mu x^{\mu-1} + a + 1 = 0 \rightarrow x(\mu x^{\mu-2} + a + 1) = 0 \rightarrow \begin{cases} x = 0 \\ x = -\frac{a+1}{\mu} \end{cases}$$

x	0	$-\frac{a+1}{\mu}$	0
y'	+	-	+
y	↗	↘	↗
		min	

$$\rightarrow f\left(-\frac{a+1}{\mu}\right) = 0 \rightarrow \left(-\frac{a+1}{\mu}\right)^{\mu} + a\left(-\frac{a+1}{\mu}\right) + \left(-\frac{a+1}{\mu}\right) = 0$$

$$\rightarrow \frac{-\mu a^{\mu}}{\mu} + \frac{\mu a^{\mu}}{\mu} + \mu = 0 \rightarrow a^{\mu} = -\mu \rightarrow a = -\mu$$

$$x = -\frac{a+1}{\mu} \rightarrow x_{\min} = \frac{-(-\mu)-1}{\mu} = 1$$

سوال ۱۸

$$f'(x) = \mu x^{\mu-1} - 12x = 0 \rightarrow \mu x^{\mu-1} - 12x = 0 \rightarrow \begin{cases} x = 0 \\ x = \pm \sqrt{\mu} \end{cases}$$

$$A(-\sqrt{\mu}, -12), B(\sqrt{\mu}, -12) \rightarrow M_{AB} = 0$$

x	$-\sqrt{\mu}$	0	$\sqrt{\mu}$
y'	-	+	-
y	↘	↗	↘
	min	max	min

$$f''(x) = \mu(\mu-1)x^{\mu-2} - 12 = 0 \rightarrow \mu(\mu-1)x^{\mu-2} = 12 \rightarrow x = \pm 1 \rightarrow \text{جهت } x \rightarrow C(1,0), D(-1,0) \rightarrow M_{CD} = 0$$

دو خط AB و CD را در سراسر آنجا قرار می‌دهیم