$f_+(0) >$ $a+|x| \to$

$0 > 0 \to$ 1

مبنا/ مومنی سه‌شنبه ۹ تا ۱۷ دوازدهم

آ –

تابع در نقطه $x=0$ مشتق‌ناپذیر است زیرا ←

$x<1 \to a+|x|$

$x<0 \to f'_-(0) = -1$

$\to f'_+(0) = 1$

پس در سایر نقاط از جمله $x=1$ مشتق‌پذیر است

پیوستگی $\to a+1=b$

$f'_+(1) = b \times \dfrac{2x}{3\sqrt[3]{x^4}} = \dfrac{2b}{3}$ $\quad f'_-(1) = a+x \Rightarrow 1$

$\dfrac{2b}{3} = 1 \Rightarrow b = \dfrac{3}{2}$ $\quad a = \dfrac{1}{2} \to \boxed{a+b=2}$

-2

$$f(x)=\frac{2|x-2|}{\sqrt[3]{x^2}} \qquad g(x)=\frac{|x-2|+\sqrt{3x}}{\sqrt[3]{x^2}} \rightarrow f(x)-2g(x)=\frac{2|x-2|-2|x-2|-2\sqrt{3x}}{\sqrt[3]{x^2}}$$

$$=\frac{-2\sqrt{3x}}{\sqrt[3]{x^2}} \rightarrow f'(x)-2g'(x)=\frac{\frac{-6}{2\sqrt{3x}}\left(\sqrt[3]{x^2}\right)-\frac{2x}{3\sqrt[3]{x^4}}\left(-2\sqrt{3x}\right)}{1}$$

$$=\frac{-6}{2\sqrt{3}}(1)-\frac{2}{3}(-2\sqrt{3})=-\sqrt{3}+\frac{4\sqrt{3}}{3}=\frac{\sqrt{3}}{3}$$

-3

بررسی پیوستگی $\rightarrow ab+c=\frac{1}{a}$ مشتق پذیری $\rightarrow b=-\frac{1}{x^2}=\frac{-1}{a^2} \rightarrow a^2b=-1$

$\rightarrow a^2b+ac=1 \rightarrow ac=2$

-۲

$m>1 \to f'(a) = \frac{f(x)-f(a)}{x-a} = \frac{b+(x-a)^m - b}{x-a} = \frac{(x-a)^m}{x-a} \to m>1 \to$ $\left.\begin{array}{l} f'_+(a)=0 \\ f'_-(a)=0 \end{array}\right\} \to$ مشتق‌پذیر

$\boxed{m=1} \to$ $\left.\begin{array}{l} f'_-(a)=0 \\ f'_+(a)=1 \quad b+(x-a) \to \end{array}\right\} \to$ نقطهٔ زاویه‌دار

$m=0 \to \left.\begin{array}{ll} b & x<a \\ b+1 & x \geq a \end{array}\right\} \to \times$

-۵

$$f(x)=\frac{1}{\sqrt[۳]{x-(-x)}}=\frac{1}{\sqrt[۳]{۲x}} \qquad g(x)=\frac{1}{x^{۳}-(-x^{۳})}=\frac{1}{۲x^{۳}}$$

$$g'(x)f'(g(x))=fog'(x) \qquad fog(x)=\frac{1}{\sqrt[۳]{۲\times\frac{1}{۲x^{۳}}}}=x \rightarrow fog'(x)=1$$

-۶

$$f'(۳)=-a \qquad f(۳)=-۳a-۵ \qquad -a+۳a+۵=۲a+۵=۲\rightarrow a=-\frac{۳}{۲}$$

$$f(۳)=\frac{۹}{۲}-۵=-\frac{1}{۲} \qquad f'(۳)=\frac{۳}{۲} \rightarrow \frac{f(۳)}{f'(۳)}=-\frac{1}{۲}\times\frac{۲}{۳}=-\frac{1}{۳}$$

$$g(x) = \frac{-2x}{3\sqrt[3]{(x^2-1)^4}} = \frac{-1}{\sqrt{8}} \qquad f(x) =$$

-7

$$g'(x) = \frac{-2x}{3\sqrt[3]{(x^2-1)^4}} \rightarrow g'\left(\frac{3}{\sqrt{8}}\right) = -8\sqrt{2} \qquad f'(x) = 2\left(x\left[x^2+\frac{1}{2}\right]\right)\left(\left[x^2+\frac{1}{2}\right]\right)$$

$$\rightarrow f'(2) = 2\times 2\times 4\times 4 = 64$$

$$fog'\left(\frac{3}{\sqrt{8}}\right) = g'\left(\frac{3}{\sqrt{8}}\right) f'\Big(\underbrace{g\left(\frac{3}{\sqrt{8}}\right)}_{2}\Big) = -8\sqrt{2}\times 64 = -2^9\sqrt{2} \rightarrow \frac{-2^9\sqrt{2}}{-2^7\sqrt{2}} = 4$$

$g'(x)=f'(x+۱)+۳f'(۳x+۱۰) \rightarrow x=-۲ \rightarrow g'(-۲)=f'(-۱)+۳f'(۴)$ -۸

$f'(-۱)=\frac{۳}{۲} \rightarrow f'(-۱+۵)=\frac{۳}{۲} \rightarrow f'(۴)=\frac{۳}{۲} \rightarrow g'(-۲)=\frac{۳}{۲}+\frac{۹}{۲}=۶$

Hope $\rightarrow \frac{-۲f'(۵-h)f(۵-h)+۳f'(۵-h)}{۵-h} \Rightarrow \frac{-۲f'(۵)f(۵)+۳f'(۵)}{۵}$ -۹

$f(۵)=(۵-۴)\sqrt[۳]{۸}=۲ \quad f'(x)=\sqrt[۳]{x+۳}+\frac{۱}{۳\sqrt[۳]{(x+۳)^۲}}(x-۴) \rightarrow f'(۵)=۲+\frac{۱}{۱۲}=\frac{۲۵}{۱۲}$

$\frac{-۲\times\frac{۲۵}{۱۲}\times۲+\frac{۲۵}{۴}}{۵}=\frac{-\frac{۲۵}{۳}+\frac{۲۵}{۴}}{۵}=-\frac{۵}{۳}+\frac{۵}{۴}=\frac{-۲۰+۱۵}{۱۲}=-\frac{۵}{۱۲}$

-1 $\qquad$ -1

$y = \frac{1}{2}x + \frac{1}{4} \quad a = \frac{1}{2} \rightarrow a_{\text{مماس}} = -2 \quad y' = 2x - 4 \rightarrow 2x - 4 = -2$

$\rightarrow x = 1$

$(1, 2)$