فاطمه سلطان آبادی

۲

$$f(x)=\frac{|2x-4|}{\sqrt[3]{x^2}} \longrightarrow f(1)=\frac{4-2x}{\sqrt[3]{x^2}}$$

$$\sqrt{(x-2)^2}=|x-2| \xrightarrow{x=1} 2-x$$

$$g(x)=\frac{\sqrt{x^2-4x+4}+\sqrt{3x}}{\sqrt[3]{x^2}}$$

$$f'(1)-2g'(1) \rightsquigarrow (f-2g(1))' \Rightarrow \frac{(4-2x)-2(2-x+\sqrt{3x})}{\sqrt[3]{x^2}}$$

$$\Rightarrow \frac{\cancel{4}-\cancel{2x}-\cancel{4}+\cancel{2x}-2\sqrt{3x}}{\sqrt[3]{x^2}}$$

$$\Rightarrow \frac{-2\sqrt{3x}}{\sqrt[3]{x^2}} \rightsquigarrow \frac{-2\sqrt{3}\times x^{\frac{1}{2}}}{x^{\frac{2}{3}}}$$

$$\Rightarrow -2\sqrt{3}\,(x^{-\frac{1}{6}})$$

$$\Rightarrow f'(x)=-2\sqrt{3}\left(-\frac{1}{6}\right)(x^{-\frac{7}{6}})$$

$$\Rightarrow f'(1)=\frac{\sqrt{3}}{3}$$

(۳)

$$f(x) = \begin{cases} bx + c & x < a \\ C_{f'} = b & \\ \dfrac{1}{x} & x \geq a \end{cases}$$

$$C_{f'} = \frac{-1}{x^2}$$

$$\Rightarrow ab + c = \frac{1}{a} \Rightarrow a^2 b + ac = 1$$

$$\frac{-1}{a^2} = b \Rightarrow a^2 b = -1$$

$$-1 + ac = 1$$

$$\Rightarrow ac = 2$$

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$$f'(-۱) = \frac{۳}{۲}$$

$$T = ۵$$

$$g'(-۲) = ?$$

$$g'(x) = f'(x+۱) + f'(۳x+۱۰)$$

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

$$-۱ + ۵ = ۴ \Rightarrow f'(-۱) = f'(۴) = \frac{۳}{۲}$$

(۴)

$$f(۵) = \sqrt[۳]{۸} = ۲$$

$$f(x) = (x-۴)\sqrt[۳]{x+۳}$$

$$f'(x) = \sqrt[۳]{x+۳} + \frac{۱}{۳\sqrt[۳]{(x+۳)^۲}}(x-۴)$$

$$\lim_{h\to ۰} \frac{f^۲(۵-h) - ۳f(۵-h) + ۲}{h(۵-h)}$$

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

$$\text{hop}\ \frac{-۲f(۵-h)f'(۵-h) + ۳f'(۵-h)}{۵-۲h} \Rightarrow \frac{-۲\overbrace{f(۵)}^{۲}\overbrace{f'(۵)}^{\frac{۲۵}{۱۲}} + ۳\overbrace{f'(۵)}^{\frac{۲۵}{۱۲}}}{۵}$$

$$\Rightarrow = \frac{-۵}{۱۲}$$

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$y = x^2 - 4x + 5 \longrightarrow y' = 2x - 4 \Rightarrow 2x - 4 = -2 \Rightarrow x = 1$

$6y - 3x = 1 \longrightarrow m = \frac{1}{2} \xrightarrow{\text{قرینه معکوس}} m = -2$

$f(1) = 2$

$\Rightarrow (1, 2)$ نقطه تماس

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$$f(x)=\frac{1}{\sqrt[3]{x-|x|}} \quad ,\ -x$$

$$\longrightarrow \frac{1}{\sqrt[3]{x+x}}=\frac{1}{\sqrt[3]{2x}}$$

$$g(x)=\frac{1}{x^3-|x^3|}$$

$$\longrightarrow -x^3$$

$$\Rightarrow \frac{1}{x^3-(-x^3)}=\frac{1}{2x^3}$$

$$g'(-\sqrt[3]{2})\times f'(g(-\sqrt[3]{2}))$$

$$\longrightarrow (f\circ g)'(-\sqrt[3]{2})$$

$$\longrightarrow (-)$$

$$\longrightarrow \frac{1}{\sqrt[3]{\frac{2}{2x^3}}}=\frac{1}{\frac{1}{x}}=x \Longrightarrow (f\circ g)'(-\sqrt[3]{2})=1$$

$$g(x) = \frac{1}{\sqrt[3]{x^2-1}} \Rightarrow g'(x) = \frac{-2x}{3\sqrt[3]{(x^2-1)^4}}$$

$$g'\left(\frac{3}{\sqrt{8}}\right) = \frac{-2 \times \frac{3}{\sqrt{8}}}{3\sqrt[3]{(\frac{9}{8}-1)^4}} = \frac{-6 \times 16}{3\sqrt{8}} \rightarrow -8\sqrt{2} \Rightarrow g\left(\frac{3}{\sqrt{8}}\right) = \frac{1}{\sqrt[3]{\frac{9}{8}-1}} = 2$$

$$f'(2) = 32 \times 2 = 64 \Longrightarrow f'(g(\cancel{x}^{\frac{3}{\sqrt{8}}})) = -8\sqrt{2} \times 64 = -128\sqrt{2} \times 4$$

[illegible]