

$f(x) = \lim_{x \rightarrow 1} f(x) \rightarrow a+1 = b$
 $f'_-(1) \neq f'_+(1)$
 $f'_-(1) = \frac{2x}{2\sqrt{x^2}} = 1$
 $f'_+(1) = \frac{b \cdot 2x}{3\sqrt[3]{x^4}} = \frac{2b}{3}$
 $b = \frac{3}{2} \rightarrow a = \frac{1}{2} \rightarrow a+b = 2$

$f(x) = \begin{cases} a+1x & x < 1 \\ b\sqrt[3]{x^2} & x > 1 \end{cases}$

در صورت مشتق نده $x < 1$
 در $x=1$ مشتق ده $x > 1$

$g(x) = \frac{\sqrt{(x-2)^2} + \sqrt{3x}}{\sqrt[3]{x^2}} = \frac{|x-2| + \sqrt{3x}}{\sqrt[3]{x^2}} \rightarrow g'(x) = \frac{-1 + \frac{3}{2\sqrt{3x}}}{\frac{2x}{3\sqrt[3]{x^4}}} = \frac{-1 + \frac{3}{2\sqrt{3}}}{\frac{2}{3}}$
 $f'(x) = \frac{-2}{\frac{2x}{3\sqrt[3]{x^4}}} = \frac{-2}{\frac{2}{3}} = -3$
 $f'(1) - 2g'(1) = -3 + 3 - \frac{9}{2\sqrt{3}} = -\frac{3\sqrt{3}}{2}$

$f'_-(a) = f'_+(a) \rightarrow b = -\frac{1}{a^2}$
 $f(a) = \lim_{x \rightarrow a} f(x) \rightarrow \frac{1}{a} = ab + c \rightarrow \frac{1}{a} = -\frac{1}{a} + c \rightarrow c = \frac{2}{a} \rightarrow ac = 2$

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

در صورت مشتق نده $f'_-(a) \neq f'_+(a)$ موجود $f'_+(a)$ و $f'_-(a)$

در صورت مشتق نده $m-1=0 \rightarrow m=1 \rightarrow$

$g'(-\sqrt[3]{2}) \neq (g'(\sqrt[3]{2})) = (f \circ g'(-\sqrt[3]{2}))' \rightarrow$
 $g(-\sqrt[3]{2}) = \frac{1}{2x^3} \Rightarrow g'(x) = \frac{-6x^2}{4x^6} = \frac{6\sqrt[3]{4}}{16}$
 $f'(-\sqrt[3]{2}) = \frac{1}{3\sqrt[3]{2x}} \cdot f'(x) = \frac{3\sqrt[3]{4x^2}}{2} = \frac{3\sqrt[3]{\frac{1}{4}}}{2} = \frac{3}{2\sqrt[3]{4}}$

$x \rightarrow \frac{9}{16}$

$$\left. \begin{aligned} f(3) &= -3a - 5 \\ f'(3) &= -a \end{aligned} \right\} -a + 3a + 5 = 2 \rightarrow 2a = -3 \rightarrow a = -\frac{3}{2}$$

$$f(3) = \frac{9}{2} - 5 = -\frac{1}{2} \quad \frac{f(3)}{f'(3)} = \frac{-\frac{1}{2}}{-\frac{3}{2}} = \frac{1}{3}$$

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$$f \circ g(x) = g'(x) \times f(g(x))$$

$$g\left(\frac{3}{\sqrt{8}}\right) = 2 \quad g'(x) = (x^2 - 1)^{-\frac{1}{3}} \rightarrow -\frac{1}{3}(x^2 - 1)^{-\frac{4}{3}} \times 2x = \frac{-2x}{3^3 \sqrt{(x^2 - 1)^4}} \rightarrow g(x) = -8\sqrt{2}$$

$$f'(2) = 32x = 64$$

$$\frac{-8\sqrt{2} \times 64}{-128\sqrt{2}} = 4$$

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$$g'(x) = f'(x+1) + 3f'(3x+10) = f'(-1) + 3f'(4) \xrightarrow{T=5} 4f'(-1) = 6$$

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$$\frac{f^2(5-h) - 3f(5-h) + 2}{h(5-h)} = \frac{(f(5-h)-1)(f(5-h)-2)}{h(5-h)} \rightarrow f(5)$$

$$f(5) = 2 \quad f'(x) = 3\sqrt{x+3} + \frac{x-4}{3^3 \sqrt{(x+3)^2}} = 2 + \frac{1}{12} = \frac{25}{12}$$

$$\frac{25}{12} \times \frac{1}{5} = \frac{5}{12}$$

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$$6y = 3x + 1 \rightarrow y = \frac{1}{2}x + \frac{1}{2} \rightarrow f'(x) = -2$$

$$2x - 4 = -2 \rightarrow 2x = 2 \rightarrow x = 1$$

$$y = 2$$

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