۱۵٫۲۵

نمره نهایی

-۱

$a+1=b$

$\frac{2x}{2\sqrt{x^2}} \neq \frac{2x}{3\sqrt[3]{x}} \alpha b \Rightarrow 1=\frac{2}{3}b \Rightarrow b=\frac{3}{2}$ $\quad a+b=2a+1=2b-1=3-1=2$ ✓

(۲)

$f'(1)=\frac{-2\sqrt[3]{x^2}-\frac{2x}{3\sqrt[3]{x}}(-2x+4)}{x\sqrt[3]{x}}=\frac{-6x-2x(-2x+4)}{(x\sqrt[3]{x})(3\sqrt[3]{x})}=\frac{-6x+4x^2-8x}{3x\sqrt[3]{x^2}}=\frac{4x-14}{3\sqrt[3]{x^2}}=-\frac{10}{3}$

$|2x-4| \rightarrow -2x+4$

۱٫۷۵

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

$=\frac{-10+\sqrt{3}}{6} \Rightarrow -\frac{10}{3}+\frac{10-\sqrt{3}}{3}=-\frac{\sqrt{3}}{3}$

$f'(1)-2g'(1)$

$f'(1)-2g'(1)=\frac{-10}{3}-2\left(\frac{-5}{3}-\frac{\sqrt{3}}{6}\right)=\frac{\sqrt{3}}{3}$

-۳

$b(a)+c=\frac{1}{a}$

$b=-\frac{1}{a^2} \Rightarrow -\frac{1}{a}+c=\frac{1}{a} \Rightarrow c=\frac{2}{a} \Rightarrow ca=\frac{2}{a}a=2$ ✓

(۲)

نقطه گوشه $\rightarrow f'_-(a)\neq f'_+(a)$ $\quad m\geq 2 \rightarrow \begin{cases} f'_-(a)=0 \\ f'_+(a)=0 \end{cases} \rightarrow f'_-(a)=f'_+(a)$ غ ق ق

-۴

$b=b+(a-a)^m \quad m\neq 0$

$m=0 \rightarrow f'_-(a)=f'_+(a) \times$ غ ق ق

(۰)

$m(x-a)^{m-1}\alpha 1=0 \Rightarrow m\neq 1$

$m=1 \rightarrow \begin{cases} f'_-(a)=0 \\ f'_+(a)=1 \end{cases} \rightarrow f'_-(a)\neq f'_+(a)$

یک مقدار صحیح m

$f\circ g'(-\sqrt[3]{2}) \Rightarrow \frac{1}{3\sqrt[3]{\frac{1}{x-|x|^3}\left|\frac{1}{x-|x|^3}\right|}} \Rightarrow \frac{1}{\frac{\frac{+3x^2+3x^2}{(2x^3)^2}+\frac{3x^2+3x^2}{(2x^3)^2}}{3\sqrt[3]{\frac{2}{2x^3}}}}=\frac{\frac{1}{\frac{12x^2}{4x^6}x^3}}{\frac{3}{x}}=\frac{1}{\frac{3}{x}}x^{-5}x^2=x^2$

$\Rightarrow f\circ g'(-\sqrt[3]{2})=\sqrt[3]{4}$

(۱)

$g(x)=\frac{1}{2x^3}$ $\quad$ تابع $g(x)$ ← برای مقادیر مثبت تعریف شده ← برای مقادیر منفی:

$f(x)=\frac{1}{\sqrt[3]{2x}}$ $\quad$ تابع $f(x)$ ← برای مقادیر منفی تعریف شده است:

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

-6

$y = -3a - 5$

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

(1,5)

$y = -3a - 5 = f(3) \quad f'(3) + 3a + 5 = 2 \Rightarrow 2a = -3 \Rightarrow a = -\frac{3}{2} \Rightarrow \frac{f(3)}{f'(3)} = \frac{-\frac{1}{2}}{-1} = \frac{1}{2}$

$\Rightarrow f(3) = \frac{3}{2} \times 3 - 5 = \frac{9}{2} - \frac{10}{2} = -\frac{1}{2} \qquad f'(3) = -a$

-7

$f'(g(\frac{3}{\sqrt{8}})) \times g'(\frac{3}{\sqrt{8}})$

$g'(x) = -\frac{1}{3}(x^2-1)^{-\frac{4}{3}} \times 2x = -\frac{2}{3}x(x^2-1)^{-\frac{4}{3}}$

$g'(\frac{3}{\sqrt{8}}) = -8\sqrt{2}$

$g(\frac{3}{\sqrt{8}}) = \frac{1}{\sqrt[3]{\frac{9}{8}-\frac{8}{8}}} = \frac{1}{\frac{1}{2}} = 2$ ✓

$y' = g'(\frac{3}{\sqrt{8}}) f'(2) = -8\sqrt{2} \times 64 = 4 \times (-128\sqrt{2}) \longrightarrow$ ۴ برابر

(1)

$g'(x) = \frac{1}{\frac{3x}{3\sqrt[3]{(x^2-1)^2}}} \Rightarrow g'(\frac{3}{\sqrt{8}}) = \frac{1}{\frac{\frac{9}{\sqrt{8}}}{3\sqrt[3]{(\frac{1}{8})^2}}} = \frac{\frac{1}{4}}{\frac{\frac{9}{\sqrt{8}}}{\frac{3}{4}}} = \frac{1}{\frac{9}{\sqrt{8}}} = \frac{\sqrt{8}}{9}$

$\Rightarrow 64 \times \frac{\sqrt{8}}{8} = 8\sqrt{8}$

$f'(x) = 2(x[x^2+\frac{1}{2}]) \times [x^2+\frac{1}{2}] \Rightarrow f'(2) = 4[2 \times 4 + \frac{1}{2}] \times 4 = 64$ ✓

-8

$g'(2) = f'(-1) + 3f'(4) = 4 \times \frac{3}{2} = 6$ ✓

$\frac{3}{2} \qquad 3 \times \frac{1}{2}$

(3)

-9

$f(5) \lim_{h \to 0} \frac{(f(5-h)-1)(f(5-h)-2)}{h(5-h) \times 5} = -\frac{25}{12} \times \frac{1}{5}$

$-\frac{(2 - f(5-h))}{(5-h)h} = -f'(5) = -\frac{25}{12} \qquad = -\frac{5}{12}$ ✓

$f'(x) = \sqrt[3]{x+3} + \frac{1}{3\sqrt[3]{(x+3)^2}}(x-5)$

$f'(5) = 2 + \frac{1}{3 \times 4} = \frac{24+1}{12} = \frac{25}{12}$

$f(5) = 2$

(2)

-10

$y = 1 + \frac{3x}{6} \Rightarrow \frac{1}{2} \times -2 = -1$

$y' = 2x - 4 = -2 \Rightarrow x = 1 \quad y = 1 - 4 + 5 = 2 \Rightarrow (1,2)$ ✓

(2)