کامیار شکری دوازدهم تجربی B

$\lim f(x) = f(x) \Rightarrow a+1 = b \quad a-b=-1$

۱)

$f'(x) = \begin{cases} 1 & x<1 \\ \frac{2}{3}b & x\frac{1}{\sqrt[3]{x}} \end{cases} \Rightarrow f'_+(1) = f'_-(1) \Rightarrow \frac{2}{3}b = 1$

$b = \frac{3}{2} \quad a = \frac{1}{2} \quad a+b = 2$

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

۲)

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

$f-2g = \frac{-2\sqrt{3x}}{\sqrt[3]{x^2}} = \frac{-2\sqrt{3}\times x^{\frac{3}{6}}}{x^{\frac{4}{6}}} = -2\sqrt{3}\times x^{-\frac{1}{6}}$

$-\frac{1}{6}(-2\sqrt{3})\times x^{-\frac{7}{6}} \Rightarrow x=1 \to \underbrace{\frac{\sqrt{3}}{3} = f'(1)-2g'(1)}$

$a\times b+c = \frac{1}{a} \to a^2b+ac=1$

۳)

$f'(x) = \begin{cases} b & x<a \\ -\frac{1}{x^2} & x\geq a \end{cases} \quad f'_-(a) = f'_+(a) \Rightarrow b = \frac{-1}{a^2} \Rightarrow a^2b = -1$

$a^2b+ax=1 \quad a^2b=-1 \Rightarrow ac=2$

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۴)

$f'(x) \begin{cases} 0 & : x<a \\ m(x-a)^{m-1} & x\geq a \end{cases} \quad f'_-(a)=0 \quad f'_+(a)=0 \Rightarrow m\neq 1$

(اگر m را بزرگتر از یک در نظر بگیریم مشتق راست صفر می‌شد)

۱۰

(۵

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

$$g(x) = \frac{1}{2x^3} \quad x<0 \qquad f(x) = \frac{1}{\sqrt[3]{2x}} \quad (x<0)$$

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

$$f\circ g'(x) = 1$$

(۶

$$\left.\begin{array}{l} g' = -a = f'(3) \\ x = 3 \end{array}\right\} \Rightarrow g = -3a - 5 = f(3)$$

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

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

(۷

$$f\circ g'\left(\frac{3}{\sqrt{8}}\right) = g'\left(\frac{3}{\sqrt{8}}\right) \times f'\left(g\left(\frac{3}{\sqrt{8}}\right)\right)$$

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

$$g'\left(\frac{\sqrt{3}}{8}\right) \Rightarrow g\left(\frac{3}{\sqrt{8}}\right) = 2$$

$$f'(x) = 2([x^2 + \tfrac{1}{2}])(x[x^2 + \tfrac{1}{2}]) \xrightarrow{x=2} f'(2) = 64$$

$$f\circ g' = \frac{3}{\sqrt{8}} = 128\sqrt{2} \Rightarrow \frac{128\sqrt{2}}{-128\sqrt{2}} = -1$$

$g'(x) = f'(x+1) + ۲f'(۲x+1) \xrightarrow{x=۲} g'(-۲) = f'(-1) + ۲f'(۴)$

$= ۴f'(-1) = ۴ \times \frac{۳}{۲} = ۶$

(۸

$\frac{-۲f'(۵-h)\, f(۵-h) + ۳f'(۵-h)}{-۲h + ۵} \Rightarrow \underline{h \to 0}$

(۹

$\Rightarrow \frac{-۲f'(۵)\, f(۵) + ۳f'(۵)}{۵} \Rightarrow f'(x) = \sqrt[۳]{x+۳} + (x-۴) \times \frac{1}{۳} \times$

$\frac{1}{\sqrt[۳]{(x+۳)^۲}} \xrightarrow{x=۵} ۲ + \frac{1}{۱۲} = \frac{۲۵}{۱۲} = f'(۵)$

$\frac{f'(۵)}{۵} = \frac{۵}{۱۲}$

$۶y - ۳x = 1 \qquad ۶y = 1 + ۳x \quad (y = \frac{1}{۶} + \frac{1}{۲}x)$

$y = \frac{1}{۲}x + \frac{1}{۶} \Rightarrow m = \frac{1}{۲} \Rightarrow m' = -۲$

۱۵

$\Rightarrow g' = ۲x - ۴ = -۲ \Rightarrow x = 1 \quad A(1, ۲)$