

$$\lim_{n \rightarrow 1^+} f(n) = \lim_{n \rightarrow 1^-} f(n) = f(1) \Rightarrow a+1=b$$

تابع در $n=0$ مشتق ناپذیر $\Rightarrow$ مشتق پذیر در $n=1$ $\Rightarrow f'_-(1) = f'_+(1) \Rightarrow 1 = \frac{2}{3}b$

$$\Rightarrow b = \frac{3}{2} \text{ و } a = \frac{1}{2} \Rightarrow a+b=2 \checkmark$$

$$f'(1) - 2g'(1) = [f(1) - 2g(1)]' \Rightarrow f(1) - 2g(1) =$$

$$\approx \frac{|2n-3|}{\sqrt[3]{n^2}} - \frac{2\sqrt{n^2-5n+5} + \sqrt{4n}}{\sqrt[3]{n^2}} = \frac{-2\sqrt{4n}}{\sqrt[3]{n^2}} = -2\sqrt{2}n^{-\frac{1}{6}}$$

$$-2\sqrt{2}n^{-\frac{1}{6}} \xrightarrow{\text{مشتق}} \frac{\sqrt{2}}{3}n^{-\frac{7}{6}} \xrightarrow{n=1} \frac{\sqrt{2}}{3} f'(1) - 2g'(1) = \frac{\sqrt{2}}{3} \checkmark$$

$$\lim_{n \rightarrow a^+} f(n) = \lim_{n \rightarrow a^-} f(n) = f(a)$$

$$\Rightarrow ba+c = \frac{1}{a} \Rightarrow -\frac{1}{a} + c = \frac{1}{a} \Rightarrow \frac{2}{a} = c \Rightarrow ac=2 \checkmark$$

$$f'_+(a) = f'_-(a) \Rightarrow b = -\frac{1}{a^2}$$

$$f'_+(a) \neq f'_-(a)$$

$$\Rightarrow ((n-a)^m + b)' \neq 0 \Rightarrow m(n-a)^{m-1} \neq 0$$

$n=a \Rightarrow m=1$ یک مقدار $\checkmark$

$$g'(x) \neq (g(x))' = (\log)'(x)$$

$$x < 0 \Rightarrow g(x) = \frac{1}{\sqrt{x}} \quad x(x) = \frac{1}{\sqrt{x}} \Rightarrow \log(x) = x$$

$$\Rightarrow (\log)'(\sqrt{x}) = 1$$

$$x'(x) = -a$$

$$x(x) = -ax - a$$

$$x'(x) - x(x) = -a - (-ax - a) = x \Rightarrow ax + a = x$$

$$\Rightarrow a = -\frac{x}{x}$$

$$\Rightarrow \frac{x(x)}{x'(x)} = \frac{-\frac{1}{x}}{-\frac{1}{x}} = \frac{1}{x}$$

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

$$\Rightarrow g'(\frac{x}{\sqrt{x}}) = -\frac{1}{\sqrt{x}} \times \sqrt{x} = -1\sqrt{x}$$

$$g(\frac{x}{\sqrt{x}}) = 2 \quad f(x) = (x^2 + 1) \rightarrow f'(x) = 2x \rightarrow f'(x) = 2x$$

$$(f \circ g)'(\frac{x}{\sqrt{x}}) = g'(\frac{x}{\sqrt{x}}) f'(g(\frac{x}{\sqrt{x}})) = -1\sqrt{x} \times 2$$

$$f'(x) = (x^2 + 1)' = 2x \Rightarrow (f \circ g)'(\frac{x}{\sqrt{x}}) = -2\sqrt{x}$$

$$\Rightarrow \text{جواب سوال} = 2 \quad y' = g'(\frac{x}{\sqrt{x}}) f'(x) = -1\sqrt{x} \times 2x = -2x\sqrt{x} \rightarrow \text{جواب}$$

$$g'(-2) = f'(-1) + 3f'(4)$$

$$f'(4) = f'(-1) \quad \text{بعلت تقارن}$$

$$\Rightarrow g'(-2) = 4f'(-1)$$

$$\Rightarrow g'(-2) = 4$$

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