

$$g(x) = f(\tan x + \sqrt{x} \cos x) \left(\tan x \times \frac{1}{\cos^2 x} + \sqrt{x} \sin x \right)$$

$$\sqrt{x} = f'(1+1)(x-1) \rightarrow f'(x) = \frac{\sqrt{x}}{x} \quad \checkmark$$

(۲)

$$g(x) = \frac{x}{x - \cos x}$$

$$f(x) = \frac{(x + \cos x)(x + \cos x - \sqrt{x} \sin x)}{(x - \cos x)(x + \cos x)} = \frac{\cos^2 x - \sqrt{x} \cos x + x}{x - \cos x}$$

$$h(x) = (f - \sqrt{x}g)(x) = \frac{\cos^2 x - \sqrt{x} \cos x + x}{x - \cos x} - \frac{x}{x - \cos x}$$

$$h(x) = \frac{-\sqrt{x} \cos x}{x - \cos x} \rightarrow h'(x) = \frac{-1}{x} \quad \checkmark$$

(۲)

$$f(x) = \begin{cases} (x - \sqrt{x})\sqrt{x} & x \geq \frac{x}{2} \\ -(x - \sqrt{x})\sqrt{x} & x < \frac{x}{2} \end{cases}$$

$$f'(x) = \begin{cases} \sqrt{x} + \frac{1}{2\sqrt{x}}(x - \sqrt{x}) & x \geq \frac{x}{2} \\ -\sqrt{x} - \frac{1}{2\sqrt{x}}(x - \sqrt{x}) & x < \frac{x}{2} \end{cases}$$

$$\left. \begin{aligned} f'_+(\frac{x}{2}) &= \sqrt{\frac{x}{2}} + \frac{1}{2\sqrt{\frac{x}{2}}} \\ f'_-(\frac{x}{2}) &= -\sqrt{\frac{x}{2}} - \frac{1}{2\sqrt{\frac{x}{2}}} \end{aligned} \right\}$$

$$\sqrt{\frac{x}{2}} = \sqrt{\frac{x}{2}} \rightarrow a = \frac{1}{\sqrt{2}} \quad \checkmark$$

(۲)

$$y = -ax + 1$$

$$(x, -ax + 1) \in f$$

$$(x, -a) \in f' \quad f'(x) = -a$$

$$\rightarrow -ax + 1 = -a \rightarrow a = \frac{1}{x} \quad \checkmark$$

(۲)

مسئله ۱۴

$$y = \frac{x}{\sqrt{x}} + \frac{a}{\sqrt{x}} = \frac{x+a}{\sqrt{x}} = \frac{ax-1}{x+1}$$

$$\rightarrow x^2 + (y - \sqrt{a})x + 1 = 0$$

$$(y - \sqrt{a}) = -1 \rightarrow a = \frac{x}{y} \rightarrow a = \frac{x}{y} \quad \checkmark$$

(۲)

در این مسئله، σ و ρ به معنی σ و ρ هستند.

$$f(x) = 0 \rightarrow \Delta x = b - a = 2$$

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

$$\begin{cases} a = -1 \\ b = 1 \end{cases}$$

$$f(x) = x^2 + a \xrightarrow{x=1} f'(x) = 2x + a = 2$$

$$b - a = -1 + 1 = 0 \quad \boxed{-1}$$

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$$f(x) \sim x^n$$

$$f'(x) \sim nx^{n-1}$$

$$L_i \rightarrow \frac{n^2 \times n \times n^{n-1}}{n^m} = n^2 \sqrt{n}$$

2

چون مقدار تابع و مقدار مشتق در هر نقطه
صفر شود نظر است هم از روی میزنیم

$$\begin{cases} x_{n-1} = x_m \\ x_n = x_m + \Delta x \end{cases} \rightarrow \begin{cases} x_{n-1} = x_m \\ x_n = x_m + \Delta x \end{cases} \rightarrow \begin{cases} x_{n-1} = x_m \\ x_n = x_m + \Delta x \end{cases}$$

1

$$(f^{-1})'(x) = ? \quad f(x) = x \rightarrow f^{-1}(x) = x$$

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

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

2

$$\xrightarrow{\text{صفر}} (f^{-1})'(x) = -1x$$

$$\frac{1 + \Delta a - \Delta}{1} = 1 \rightarrow a = \frac{1}{x}$$

$$f'(x) = ?$$

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1

$$f(x) = x(n^2 + 1)^x \times x(n^2 + 1) + a(n^2 + 1)^x \rightarrow f'(x) = 1x$$

$$f'(x) = x(n^2 + 1)^x (a(n^2 + 1) + a(n^2 + 1)^x) \xrightarrow{x=1} x(n^2 + 1)^x (a(n^2 + 1) + a(n^2 + 1)^x) = 1$$

$$f(x) = \sin x \cos x \rightarrow \frac{d}{dx} \sin x \cos x = \cos x \cos x - \sin x \sin x = \cos^2 x - \sin^2 x$$

1

$$g(x) = \sin^2 x - \cos^2 x = -\cos 2x \rightarrow \frac{d}{dx} (-\cos 2x) = 2 \sin 2x$$

$$\frac{-x}{\pi} = -1 \quad \boxed{-1}$$

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