

①

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

$$\frac{(x-1)^2 - x^2}{x(x-1)} = \frac{1 - 2x}{x(x-1)}$$

$$x^2 - 2x + 1$$

$$(x-1)(x-1)$$

$$+ \frac{1}{4} - \frac{1}{4} + \frac{1}{4} -$$

$$D_f = (-\infty, 0) \cup \left[\frac{1}{4}, 1\right)$$

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

$$\frac{1}{x-1} + \frac{1}{x+1}$$

$$\frac{x^2 + 4x - 1}{(x-1)(x+1)} = \frac{Ax + B}{(x-1)(x+1)}$$

① ②

$$\frac{Ax + B}{(x-1)(x+1)} = 0 \rightarrow Ax + B = 0 \rightarrow x = \frac{-B}{A}$$

$$D_f = \mathbb{R} - \left\{0, -1, -\frac{1}{2}, 1, \frac{-B}{A}\right\}$$

$$f(x) = \sqrt{\left(\left(\frac{1}{x}\right)^2 - 9\right)(x^2 - 25)} \rightarrow f(x) = \sqrt{\left(\frac{1}{x^2} - 9\right)(x^2 - 25)} \quad (2)$$

$$\left(\left(\frac{1}{x}\right)^2 - 9\right)(x^2 - 25) \geq 0 \quad \begin{array}{c|c|c} \frac{\infty}{1} & -2 & \frac{\infty}{1} \\ \hline + & 0 & - & 0 & + \end{array}$$

$$Df = (-\infty, -1] \cup \left[\frac{1}{9}, +\infty\right)$$

$$\sqrt{x-1} + \sqrt{y+1} = 1 \Rightarrow \sqrt{y+1} = 1 - \sqrt{x-1}$$

$$y = 1 - \sqrt{x-1} + \sqrt{x-1} - 1 - \sqrt{x-1} = 1 - 2\sqrt{x-1}$$

$$+ \sqrt{x-1} \rightarrow x-1 \geq 0 \rightarrow x \geq 1$$

$$1 - \sqrt{x-1} \geq 0 \quad \left. \begin{array}{l} x-1 \leq 1 \\ x \leq 2 \end{array} \right\} Df = [1, 2]$$

$$f(x) = \frac{\log(x^2 - x - 2)}{\sqrt{x^2 - 1} + 1} \quad (3)$$

$$x^2 - x - 2 > 0 \rightarrow (x-2)(x+1)$$

$$x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \leq -1 \text{ or } x \geq 1$$

$$\rightarrow \mathbb{R} - [-1, 1] \quad \begin{array}{c|c|c} -1 & 1 \\ \hline + & 0 & - & 0 & + \end{array}$$

$$\sqrt{x^2 - 1} + 1 \neq 0 \rightarrow \sqrt{x^2 - 1} \neq -1$$

$$\rightarrow x^2 \neq 0 \quad x \neq 0$$

استنتاج ←

$$Df = (-\infty, -1) \cup (1, +\infty)$$

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$$\sqrt{x^2 + 4x - 2} \rightarrow x^2 + 4x - 2 \geq 0$$

$$x^2 - 4x - 2 \leq 0 \quad \text{خبره در دفتر}$$

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$$-2 \times b \leq x \quad a \leq \frac{3}{2} - \frac{\varepsilon}{2} \leq \frac{1}{2}$$

$$a + b \leq \frac{3}{2} + \frac{1}{2} \leq \frac{4}{2}$$

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$$f(x) - x \geq 0 \rightarrow f(x) \geq x \quad x \geq 1$$

$$(x+2) \geq x \rightarrow x \geq -2$$

$$Df = [-2, +\infty)$$

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$$f(x) \begin{cases} (a+1)(x+2) & x > 1 \rightarrow \sqrt{a+1} \\ \sqrt{a} + 2x & x \leq 1 \rightarrow -1 \rightarrow \sqrt{a} - \varepsilon \end{cases}$$

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$$\begin{aligned} & \left. \begin{array}{l} f(0) = f(-2) + a \\ \sqrt{a+1} \quad (\sqrt{a} - \varepsilon) \end{array} \right\} \begin{array}{l} 1 \varepsilon a + 1 \varepsilon = \varepsilon a - \varepsilon \\ 1.0 a = -1 \\ \rightarrow a = -\frac{9}{10} \end{array} \end{aligned}$$

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$$\frac{1}{r+\sqrt{r}} \leq r - \sqrt{r} + \underbrace{f(r+\sqrt{r})}_x + f\left(\frac{1}{r+\sqrt{r}}\right) \quad \textcircled{V}$$

$$f(x) + f\left(\frac{1}{x}\right) \leq r \left(\sqrt{x} + \frac{1}{\sqrt{x}} \right) + \varepsilon \rightarrow$$

$$r \left(\sqrt{r+\sqrt{r}} + \frac{1}{\sqrt{r-\sqrt{r}}} \right) + \varepsilon \rightarrow$$

$$r \left(\sqrt{r+\sqrt{r}} + \sqrt{r-\sqrt{r}} \right) + \varepsilon$$

$$\delta = r\sqrt{\varepsilon} \rightarrow (r-\sqrt{r})(r+\sqrt{r}) + r\sqrt{(r+\sqrt{r})(r-\sqrt{r})}$$

$$f(r+\sqrt{r}) + f(r-\sqrt{r}) \leq r\sqrt{\varepsilon} + \varepsilon$$

$$rf(x) - rf(-x) \leq \varepsilon x^r - x \quad f(x) \quad \textcircled{\wedge}$$

$$-rf(x) + rf(-x) \leq \varepsilon x^r + x$$

$$f(x) - \varepsilon f(-x) \leq +1x^r - rx$$

$$-rf(x) + rf(-x) \leq -\varepsilon x^r + x$$

$$-f(x) - f(-x) \leq 1x^r - r\alpha \rightarrow f(x) + f(-x) \leq 1x^r - r\alpha$$

$$rf(x) - rf(-x) \leq \varepsilon x^r - x$$

$$rf(x) \leq -r\alpha x^r + r\alpha$$

$$f(x) \leq x - \varepsilon x^r$$

$$(x+r)f(x) - rx f(x+r) \leq \varepsilon x^r - mx + m-1 \quad (9)$$

if $x=0$, $r f(0) \leq (m-1)x(-r)$

if $x=r$, $r f(0) \leq 1r + rx + m-1$

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$$0 \leq 1n - \varepsilon m \rightarrow 1n \leq \varepsilon m \rightarrow m \leq \frac{r}{\varepsilon}$$

$$r f(0) \leq \frac{r\omega}{r} \rightarrow f(0) \leq \frac{r\omega}{\varepsilon}$$

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$$f(-1) + f\left(\frac{1}{-1}\right) \leq \frac{rx^r - 1rx + r}{2} \quad (19)$$

$$f(-1) \leq \frac{(r-1r+r)}{2} x - 1 \rightarrow f(-1) \leq -9$$

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