

$$f(x) = \sqrt{\frac{x-1}{x}} - \frac{x}{x-1} \rightarrow \sqrt{\frac{x^2 - 2x + 1 - x^2}{x(x-1)}} = \sqrt{\frac{-2x+1}{x(x-1)}} \quad \begin{matrix} 0 & 1/2 & 1 \\ + & - & + \\ \infty & \text{مفرد} & \infty \end{matrix}$$

$$f(x) = \frac{\frac{1}{x+1} - \frac{2}{x}}{\frac{2}{x-1} + \frac{1}{x+2}} = \frac{\frac{x - 2x - 2}{x(x+1)}}{\frac{2x + 2 + x - 1}{(x-1)(x+2)}} = \frac{(x-1)(x+1)(-x-2)}{(x)(x+1)(x+2)} = R - \left\{0, -1, -\frac{2}{x}\right\}$$

$$f(x) = \sqrt{\left(\left(\frac{1}{3}\right)^x - 9\right)(32 - 4^x)} \quad \begin{matrix} -2 & 2/5 \\ + & - & + \\ \infty & \text{مفرد} & \infty \end{matrix} \quad D_f = (-\infty, 0) \cup [1/2, 1)$$

$$D_f = (-\infty, -2] \cup [2/5, +\infty) \quad \boxed{D_f = [1, 8/27]}$$

$$b) \sqrt{x-1} + \sqrt{y+1} = 3 \rightarrow \sqrt{y+1} = 3 - \sqrt{x-1} \rightarrow \begin{cases} x-1 \geq 0 \rightarrow x \geq 1 \\ 3 - \sqrt{x-1} \geq 0 \rightarrow 3 \geq \sqrt{x-1} \rightarrow 81 \geq x-1 \rightarrow 82 \geq x \end{cases}$$

$$f(x) = \frac{\log 4}{\sqrt{x^2-1}+1} \rightarrow \begin{matrix} -1 & 2 \\ + & - & + \\ \infty & \infty & \infty \end{matrix} \quad \begin{matrix} 0 & 0 & 0 \\ -1 & 1 & 2 \end{matrix}$$

$$D_f = (-\infty, -1) \cup (2, +\infty)$$

$$\sqrt{3+ax-x^2} \rightarrow D_f = [-2, b] \quad \begin{matrix} b = 1/2 \\ a+b = 1/0 - 0/0 = 1 \\ 2b + (b-2)x = ax + 3 \\ a = (-9/2) \end{matrix} \quad \begin{matrix} (x+2)(-x+b) = -x^2 + xb - 2x + 2b \\ -x^2 + ax + 3 \end{matrix}$$

$$f(x) = \begin{cases} 3x-2 & ; x \geq 1 \rightarrow f(x) \geq x \checkmark \\ 2x+3 & ; x < 1 \rightarrow x=1 \rightarrow f(x)=5 \end{cases} \quad \begin{matrix} x=-3 \\ f(x)=-3 \end{matrix}$$

$$g(x) = \sqrt{f(x)-x} \rightarrow f(x) \geq x \rightarrow D_f = [-3, 1) \cup [1, +\infty)$$

$$f(x) = \begin{cases} (a+1)(x+1) & ; x > 1 \\ va + vx & ; x \leq 1 \end{cases} \rightarrow f(a) = (a+1)v \rightarrow v(va+v)$$

$$va + vx \quad ; x \leq 1 \rightarrow f(1-2) = va - \varepsilon$$

$$v f(a) = f(1-2) + a \rightarrow 1 \varepsilon a + 1 \varepsilon = va - \varepsilon + a \rightarrow 1 \varepsilon a + 1 \varepsilon = \varepsilon a - \varepsilon$$

$a = -18 \leftarrow a = -9 \quad \leftarrow va + v = va + 1$

$$f(x) = \left(\sqrt{x} + \frac{1}{\sqrt{x}} \right) + 2 \rightarrow \sqrt{x + \frac{1}{x} + 2} + 2$$

$$f(2+\sqrt{2}) + f(2-\sqrt{2}) \rightarrow \sqrt{2-\sqrt{2} + \frac{1}{2-\sqrt{2}}} + 2 + 2 = \sqrt{4+2}$$

$$2 + \sqrt{2} + \frac{1}{2+\sqrt{2}} + 2 = \sqrt{4+2} \rightarrow \sqrt{4+2} + \sqrt{4+2} = 2\sqrt{4+2}$$

$$\begin{cases} v f(x) - v f(-x) = \varepsilon x^2 - x \times 2 \rightarrow f(x) - 9f(-x) = 8x^2 - 2x \\ v f(-x) - v f(x) = \varepsilon x^2 + x \times 3 \rightarrow 9f(-x) - 9f(x) = 12x^2 + 3x \end{cases}$$

$$11 - 5f(x) = 20x^2 + x$$

$$f(x) = -\frac{4x^2 - x}{5}$$

$$(x+2)f(x) - vx f(x+2) = \varepsilon x^2 - m'x + v m - 1$$

$$x = -2 \rightarrow 0 - 3x(-2)f(0) = 16 + 2m + 3m - 1 \rightarrow (6f(0) = 15 + 5m) \times 3$$

$$x = 0 \rightarrow 2f(0) = vm - 1 \rightarrow (2f(0) = 3m - 1) \times (-5)$$

$$f(0) = 6.25$$

$$\begin{cases} 18f(0) = 15\Delta + 1\Delta m \\ -10f(0) = -1\Delta m + \Delta \end{cases} \rightarrow 8f(0) = \Delta$$

$$f(x) + f\left(\frac{1}{x}\right) = \frac{vx^2 - 12x + v}{x} \rightarrow a\left(x + \frac{1}{x}\right) + vb = \left(\frac{vx}{x} - 12 + \frac{v}{x}\right)$$

$$ax + b + \frac{a}{x} + \frac{b}{x}$$

$$\rightarrow \begin{cases} a = v \\ b = -9 \end{cases}$$

$$v\left(x + \frac{1}{x}\right) - 12$$

$$f(-1) = ? \quad ax + b = v(-1) - 9 \rightarrow -9$$