

$$f(x) = \begin{cases} 2x-1 & x \geq 0 \\ 2x+1 & x \leq 0 \end{cases}$$

$$y = \sqrt{f(x) - x + 1} \xrightarrow{(1)} \sqrt{2x-1-x+1} = \sqrt{x} \rightarrow x \geq 0 \quad I$$

$$\xrightarrow{(2)} \sqrt{2x+1-x+1} = \sqrt{x+2} \rightarrow x \geq -2 \quad II$$

$$I \cup II \rightarrow D_f = \left[-\frac{2}{3}, +\infty\right)$$

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

$$D_f = \mathbb{R} - \left\{-\frac{1}{2}\right\}$$

$$f(x) = \begin{cases} \frac{x^2 + 2x - x - 1}{x^2 - 1} & x \neq \pm 1 \Rightarrow \frac{x(x-1) + 2(x-1)}{x^2 - 1} = x+2 \\ \frac{ax+b}{x+c} & x = \pm 1 \end{cases}$$

$$g(x) = x+c$$

$$x+c = x+2 \Rightarrow c=2$$

$$x=1 \Rightarrow \frac{a+2}{1+b} = 2 \rightarrow a+2 = 2+2b \rightarrow \begin{cases} 2b-a = -1 \\ b+a = 2 \end{cases} \rightarrow \begin{cases} b = \frac{1}{3} \\ a = \frac{5}{3} \end{cases}$$

$$x=-1 \Rightarrow \frac{-a+2}{-1+b} = 1 \rightarrow -a+2 = -1+b \rightarrow \begin{cases} b+a = 3 \\ a = \frac{5}{3} \end{cases}$$

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

$$g(x) = \frac{x^2-1}{x^2+ax+b} = \frac{(x+1)(x-1)}{(x-1)^2} = \frac{x+1}{x-1}$$

$$\frac{x+1}{x-c} = \frac{x+1}{x-1} \rightarrow c=1$$

$$a+b+c=0 \rightarrow a+b+1=0 \rightarrow a+b=-1$$

$$x^2-2x+1 \rightarrow a=-2, b=1$$

$$f(x) = (x-2)^2(x-1)$$

$$f(x+1) = (x-2)^2(x)$$

$$f(1-x) = (-x-2)^2(-x)$$

$$g(x) = f(x+1) + f(1-x) = x^3 - 4x^2 + 4x - x^3 - 4x^2 - 4x = -8x^2$$

$$f(1-r_n) = \begin{cases} \sqrt{x+r} & x \leq 0 \\ \varepsilon \sqrt{x} & x > 0 \end{cases}$$

$$f(-1) = f(1-r_n) \rightarrow 1-r_n = -1 \rightarrow -r_n = -2 \rightarrow n=1$$

$$f(-1) = \varepsilon$$

$$f(r) = f(1-r_n) = r = 1-r_n \rightarrow x = -1$$

$$f(r) = 1$$

$$f(-1) + f(r) = \varepsilon + 1 = \Delta$$

$$f(x+\sqrt{x}) = x^{\frac{\varepsilon}{2}} + r_n$$

$$x+\sqrt{x} = y \rightarrow x+\sqrt{x}-y=0 \quad (\sqrt{x+r})(\sqrt{x-r})=0 \rightarrow x=r$$

$$f(y) = (f)^{\frac{\varepsilon}{2}} + 1r = r \Delta y + 1r = r \Delta y$$

$$f(x) = x^{\frac{r}{2}} + x \rightarrow f(x-1) = (x-1)^{\frac{r}{2}} + x-1 = x^{\frac{r}{2}} - r x^{\frac{r}{2}} + r x - 1 + x - 1 = x^{\frac{r}{2}} - r x^{\frac{r}{2}} + \varepsilon x - r$$

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

$$f(x-1) + f(1-x) = 0$$

$$f(x) = \sqrt{r_n - r_a} + K - 1 \xrightarrow{r_f - g} r \sqrt{\varepsilon_n - r_a} + r K - r - \sqrt{b - \varepsilon_n} - r K = r \sqrt{\varepsilon_n - r_a} - \sqrt{b - \varepsilon_n} - K$$

$$g(x) = \sqrt{b - \varepsilon_n} + r K \xrightarrow{n=1} r \sqrt{\varepsilon - r_a} - \sqrt{b - \varepsilon} - K - r = K$$

$$\Rightarrow -K - r = K \rightarrow r K = -r \rightarrow K = -1$$

$$a = \frac{\varepsilon}{r} \leftarrow \frac{r_a}{\varepsilon} = 1$$

$$b = \varepsilon \leftarrow \frac{b}{\varepsilon} = 1$$

$$r_a - \frac{b}{r} - K = \varepsilon - r + 1 = r$$

$$f(r) = \sqrt{m-x} + n \rightarrow D_f = m \geq x \quad \left\{ \begin{array}{l} \rightarrow D_{f \times g} = [-1, m] = [-1, v] \rightarrow m = v \end{array} \right.$$

$$g(x) = \sqrt{rx+r} \rightarrow D_g = x \geq -1$$

$$f-g(r) = \sqrt{m-x} - \sqrt{rx+r} = 0 \rightarrow n = -r + \sqrt{rx+r}$$

$$m+n = v - r + \sqrt{rx+r} = \Delta + \sqrt{rx+r}$$