

3. ايجاد دالة

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

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

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

$$\text{I} \cup \text{II} \rightarrow D_f = \left[-\frac{2}{1}, +\infty\right)$$

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

$$D_f = \mathbb{R} - \{-1\}$$

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

$$x=1 \Rightarrow \frac{a+b}{1+c} = 1 \rightarrow a+b = 1+c$$

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

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

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

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

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

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

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

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

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

(2) (6)

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

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

$$f(r) = \varepsilon$$

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

$$f(x+\sqrt{x}) = x^{\frac{1}{2}} + r_n$$

(2) (7)

$$x+\sqrt{x} = 4 \rightarrow x+\sqrt{x}-4=0 \quad (\sqrt{x}+r)(\sqrt{x}-r)=0 \rightarrow x=\varepsilon$$

$$f(4) = (f) + 1r = r\omega 4 + 1r = r\omega 4$$

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

(2) (8)

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

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

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

(2)

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

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

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

$\Leftarrow$ case: $\frac{r_a}{\varepsilon} = 1$

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

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

$$f(r) = \sqrt{m-x} + n \rightarrow D_f = m \geq x \rightarrow D_{f \times g} = [-1, m] = [-1, \sqrt{v}] \rightarrow m = \sqrt{v}$$

(2)

(10)

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

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

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