

$$\begin{aligned} x > \omega &\rightarrow x_{n-1} - n + 1 > 0 \rightarrow [\omega, +\infty) \\ x < \omega &\rightarrow (x_{n-1} - n + 1) > 0 \rightarrow x_{n-1} + \varepsilon > 0 \rightarrow x > \frac{\varepsilon}{r} \rightarrow \left[\frac{\varepsilon}{r}, \omega\right) \end{aligned} \quad \left. \vphantom{\begin{aligned} x > \omega \\ x < \omega \end{aligned}} \right\} \left[\frac{\varepsilon}{r}, +\infty\right)$$

$$\frac{r(\Lambda x^r + (1-r)x_{n+1})}{(x_{n+1})^r} = \frac{r(x_{n+1})^r}{(x_{n+1})^r} = \frac{r}{x_{n+1}} \rightarrow (x_{n+1})^r \neq 0 \rightarrow x \neq \frac{1}{r} \rightarrow D \setminus R = \left\{\frac{1}{r}\right\}$$

$$\frac{x^r + rx^r - x - r}{x^r - 1} = \frac{(x+r)(x^r - 1)}{x^r - 1} = x + r \xrightarrow{x \neq 1, x \neq -1} x + r = x + c \rightarrow c = r$$

$$\begin{aligned} x=1 &\rightarrow \frac{a+r}{1+b} = r \rightarrow a+r = r+b \\ x=-1 &\rightarrow \frac{-a+r}{-1+b} = 1 \rightarrow -a+b = 1 \end{aligned} \quad \left. \vphantom{\begin{aligned} x=1 \\ x=-1 \end{aligned}} \right\} b = \frac{1}{r} \rightarrow b+c = \frac{1}{r} + r = \frac{\omega}{r}$$

$$\frac{x+1}{x-c} = \frac{(x-1)(x+1)}{x^r + ax + b} \Rightarrow x^r + ax + b = \underbrace{(x-1)(x-c)}_{x^r - (c+1)x + c} \rightarrow a = -(c+1), b = c$$

$$D_f = D_g \rightarrow x-c = (x-1)(x-c) \rightarrow c=1 \rightarrow a=-2, b=1, c=1 \rightarrow a+b+c=0$$

$$\begin{aligned} f_{(x+1)} &= (x_{n+1}^r - r)^r (x_{n+1} - 1) = (x-r)^r x \\ f_{(1-x)} &= ((1-x)^r - r)^r ((1-x) - 1) = (x+r)^r (-x) \end{aligned} \quad \left. \vphantom{\begin{aligned} f_{(x+1)} \\ f_{(1-x)} \end{aligned}} \right\} g(x) = x(x-r)^r - x(x+r)^r = x[(x-r)^r - (x+r)^r]$$

$$\downarrow$$

$$g(x) = -\Lambda x^r \leftarrow x(-\Lambda x)$$

$1 - \sqrt{x} = -1 \rightarrow x = 1 \rightarrow f(-1) = \varepsilon \sqrt{1} = \varepsilon$ $1 - \sqrt{x} = \sqrt{x} \rightarrow x = -1 \rightarrow f(\sqrt{x}) = \sqrt{-1} + \sqrt{x} = -1 + \sqrt{x} = 1$ $\left. \begin{array}{l} 1 - \sqrt{x} = -1 \\ 1 - \sqrt{x} = \sqrt{x} \end{array} \right\} 1 + \varepsilon = \omega$	6
$x + \sqrt{x} = 9 \rightarrow \sqrt{x} = t \rightarrow t^2 + t = 9 \rightarrow t^2 + t - 9 = 0 \rightarrow (t - r)(t + r) = 0 \xrightarrow{\sqrt{x} \geq 0} \sqrt{x} = r \rightarrow x = \varepsilon$ $f(x) = \varepsilon \xrightarrow{\varepsilon} r(\varepsilon) = r\omega + 1r = r\omega + 1$	7
$f(x-1) = (x-1)^r + (x-1)$ $f(1-x) = -(x-1)^r - (x-1)$ $\left. \begin{array}{l} f(x-1) = (x-1)^r + (x-1) \\ f(1-x) = -(x-1)^r - (x-1) \end{array} \right\} f(x-1) + f(1-x) = 0$	8
$D_f = \varepsilon x - r a \geq 0 \Rightarrow x \geq \frac{ra}{\varepsilon} \rightarrow \frac{ra}{\varepsilon} = 1 \rightarrow a = \frac{\varepsilon}{r}$ $D_g = b - \varepsilon x \geq 0 \Rightarrow x \leq \frac{b}{\varepsilon} \rightarrow \frac{b}{\varepsilon} = 1 \rightarrow b = \varepsilon$ $r \frac{\varepsilon}{r} - \frac{\varepsilon}{r} - (-1) = \varepsilon - r + 1 = \overline{r}$ $\rightarrow x = 1 \rightarrow r(k-1) - r/k = k \rightarrow r = r/k$ $\downarrow$ $k = -1$	9
$D_g = r x + r \geq 0 \rightarrow x \geq -1, D_f = m - x \geq 0 \rightarrow x \leq m \rightarrow [-1, m] \rightarrow m = \sqrt{v}$ $f(r) = \sqrt{v - r} + n = r + n$ $g(r) = \sqrt{r(r) + r} = \sqrt{n} = \omega \sqrt{r}$ $\left. \begin{array}{l} f(r) = \sqrt{v - r} + n = r + n \\ g(r) = \sqrt{r(r) + r} = \sqrt{n} = \omega \sqrt{r} \end{array} \right\} \begin{array}{l} r + n - r\sqrt{r} = \omega \sqrt{r} \rightarrow n = \omega \sqrt{r} - r \\ m + n = \sqrt{v} + \omega \sqrt{r} - r \\ \downarrow \\ \omega + \omega \sqrt{r} \end{array}$	10