

$$f(n) = n + 1 \geq 0 \quad [n] > 1 \rightarrow [n] \geq \omega, [n] \leq 1 \rightarrow n \leq \omega$$

$$\begin{cases} n - 1 - n + 1 \geq 0 & n \geq \omega \\ f(n) + 1 - n + 1 \geq 0 & n < \omega \end{cases} \rightarrow \begin{cases} n \geq \omega \rightarrow [\omega, +\infty) \\ n + 1 \geq 0 \rightarrow n \geq -\frac{1}{\omega}, n < \omega \end{cases}$$

$$\Rightarrow D = \left[-\frac{1}{\omega}, +\infty\right)$$

$$y = \frac{p(pn^p + p^p n^p + 1)n + p^p}{(pn^p + p^p n^p + 1)^p} \rightarrow y = \frac{p(\Lambda n^p + 1)(pn^p + 1)}{(pn^p + 1)^p} = \frac{p(pn^p + 1)^p}{(pn^p + 1)^p} \Rightarrow$$

$$y = \frac{p}{pn^p + 1} \quad \frac{pn^p + 1 \neq 0}{(pn^p + 1)^p \neq 0} \rightarrow n \neq -\frac{1}{p} \Rightarrow D_f = \mathbb{R} - \left\{-\frac{1}{p}\right\}$$

$$f(n) = \begin{cases} \frac{n^p + pn^p - n - p}{n^p - 1} & n \neq \pm 1 \\ \frac{an + p}{n + b} & n = \pm 1 \end{cases} \quad g(n) = n + c$$

$$n = 1 \rightarrow p + c = \frac{\Lambda + \Lambda - 1 - p}{p} \Rightarrow p + c = 1 \rightarrow c = 1, \quad \frac{n=1}{p} = \frac{a+1}{1+b}, 1 = \frac{p-a}{b-1}$$

$$\begin{cases} p + pb = a + 1 \\ b - 1 = p - a \end{cases} \Rightarrow \begin{cases} pb + 1 = p \\ b = \frac{1}{p} \end{cases} \Rightarrow \left(b + c = \frac{1}{p} + 1 = \frac{a}{p}\right)$$

$$f(n) = \frac{n+1}{n-c} \quad g(n) = \frac{n^p - 1}{n^p + an + b} \rightarrow (n-1)(n+1) \Rightarrow c = 1$$

$$n^p - (c+1)n + c \quad \begin{cases} c = b \rightarrow b = 1 \\ a = -(c+1) \rightarrow a = -2 \end{cases} \Rightarrow a + b + c = 0$$

$$f(n) = (n-p)^p (n-1) \quad g(n) = f(n+1) + f(1-n)$$

$$f(n+1) = (n-p)^p (n) \quad f(1-n) = (-n-p)^p (-n) = (n+p)^p (-n) = -(n+p)^p (n)$$

$$g(n) = n((n-p)^p - (n+p)^p) = (-1)^p (n^p) = -\Lambda n^p$$

$$f(1-x) = \begin{cases} \sqrt{x} + 1 & x \leq 0 \\ 1 - \sqrt{x} & x > 0 \end{cases} \quad f(f(1)) + f(1^3) \quad 1-x = -1 \rightarrow x = 1$$

$$f(-1) = 1 - \sqrt{1} = 0 \quad 1-x = 3 \rightarrow x = -1 \quad f(3) = -1 + 1 = 0$$

$$f(-1) + f(3) = 0 + 0 = 0$$

$$f(x + \sqrt{x}) = x^2 + 3x \quad x + \sqrt{x} = 9 \rightarrow t^2 + t - 9 = 0 \rightarrow (t+3)(t-6) = 0$$

$$\Rightarrow x = 9 \quad f(9) = 9^2 + 3 \cdot 9 = 81 + 27 = 108$$

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

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

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

$$\Rightarrow (x^2 - 2x + 1 + 1 - x) + (x^2 - x) = 2x^2 - 3x + 2 = 0$$

$$f(x) = \sqrt{x^2 - 1} + k - 1, \quad g(x) = \sqrt{b - x} + 3k \quad f \circ g = \{(1, k)\}$$

$$D_{f \circ g} = D_f \cap D_g \quad D_f \Rightarrow x^2 - 1 \geq 0 \rightarrow x \geq 1 \rightarrow D_f = [1, +\infty)$$

$$b - x \geq 0 \rightarrow x \leq b \rightarrow D_g = (-\infty, b] \Rightarrow \frac{1}{f} = 1 \rightarrow a = \frac{1}{f} \Rightarrow b = 1$$

$$f(1) = \sqrt{1^2 - 1} + k - 1 = k - 1, \quad g(1) = \sqrt{b - 1} + 3k = k - 1 \Rightarrow k = -1 \quad \left\{f - \frac{1}{f}(-1) = 0\right\}$$

$$f(x) = \sqrt{m - x} + h, \quad g(x) = \sqrt{px + r} \quad D_{f \circ g} = [-1, V] \quad D_f = (-\infty, m]$$

$$D_g \Rightarrow px + r \geq 0 \rightarrow x \geq -\frac{r}{p} \rightarrow D_g = [-\frac{r}{p}, +\infty) \quad D_f \Rightarrow m - x \geq 0 \rightarrow m \geq x$$

$$D_{f \circ g} = D_f \cap D_g = [-1, m] \rightarrow m = V \quad g(3) = \sqrt{4 + 3} = \sqrt{7}, \quad f(3) = \sqrt{m - 3} + h$$

$$3 + h - \sqrt{4 + 3} = \sqrt{m - 3} \rightarrow h = \sqrt{m - 3} + \sqrt{7} - 3 \quad \left\{m + h = V + \sqrt{7} - 3 = 1 + \sqrt{7} - 3\right\}$$