

$$[x] > r \rightarrow x > r \rightarrow f(x) = r_{n+1} \rightarrow y = \sqrt{r_{n+1} - x + 1} = \sqrt{x} \quad \text{G.G.}$$

$$[x] < r \rightarrow x < r \rightarrow f(x) = r_{n+1} \rightarrow y = \sqrt{r_{n+1} - x + 1} = \sqrt{r_{n+1}}$$

$$\rightarrow r_{n+1} < r \rightarrow r_{n+1} < -r \rightarrow x > -\frac{r}{2} \Rightarrow \text{I} \cap \text{II} : \boxed{-\frac{r}{2} < x < r}$$

$$\rightarrow \text{III} \cap \text{I} \cap \text{II} : -\frac{r}{2} < x \rightarrow D = \left[-\frac{r}{2}, +\infty\right)$$

$$y = \frac{r^n + r_{n+1}^n + 1}{(r_{n+1} + 1)^n} = \frac{r(1 + r_{n+1}^n + 1)}{(r_{n+1} + 1)^n} = \frac{r(r_{n+1} + 1)^n}{(r_{n+1} + 1)^n}$$

$$x \neq -\frac{1}{r} \rightarrow \boxed{y = \frac{r}{r_{n+1} + 1}} \quad D = \mathbb{R} - \left\{-\frac{1}{r}\right\}$$

$$x^r + r_{n+1}^r - x - r \stackrel{\text{polynomial}}{\rightarrow} (x-1)(x+1)(x+r) \neq 0$$

$$\frac{x^r + r_{n+1}^r - x - r}{x^r - x} \cdot \frac{x-1}{x^r + r_{n+1}^r} \rightarrow x^r + r_{n+1}^r - x - r = (x-1)(x+1)(x+r) \neq 0$$

$$\frac{r_{n+1}^r - x - r}{r_{n+1}^r - r_{n+1}}$$

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

$$x=1 \rightarrow f(x) = r \rightarrow \frac{a+r}{1+b} = r \rightarrow \begin{cases} a+r = r+b \\ a+r = b-1 \end{cases}$$

$$x=-1 \rightarrow f(x) = 1 \rightarrow \frac{-a+r}{-1+b} = 1 \rightarrow \begin{cases} -a+r = b-1 \\ -a+r = b-1 \end{cases}$$

$$a - rb = 1 \rightarrow a - \frac{r}{r} = 1 \rightarrow \boxed{a = \frac{a}{r}}$$

$$-a - b = -r$$

$$-rb = -r \rightarrow \boxed{b = \frac{1}{r}}$$

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

$$\boxed{c = r}$$

$$b + c = \frac{1}{r} + r = \boxed{\frac{a}{r}}$$

$$a + b + c = 1 - r + 1 = 0 \quad \text{is } b = r$$

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

$$D_g = \mathbb{R} - \{1, c\}$$

$$D_f = D_g = \boxed{c = 1}$$

$$\boxed{a = -r}$$

$$\boxed{b = 1}$$

$$f(x) = \frac{x+1}{x-c} \quad D_f = \mathbb{R} - \{c\}$$

$$x-c \neq 0 \rightarrow x \neq c$$

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

$$x^2 + 1 - r_{n+1} = x^2 + b + ax$$

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$$f(n+1) = (n+1-r)^r (n+1-1) = n(n-r)^r$$

$$f(1-n) = (1-n-r)^r (1-n-1) = (-n)(-n-r)^r = -n(n+r)^r$$

$$f(n+1) + f(1-n) = n[(n-r)^r - (n+r)^r] = n(n^r - r^r - (n^r + r^r))$$

$$= n(n^r - r^r - n^r - r^r) = \boxed{-2nr^r}$$

$$1-rn=1 \rightarrow rn=r \rightarrow n=1 \rightarrow f(1) = \sqrt[4]{1} = \boxed{1}$$

$$1-rn=r \rightarrow rn=r \rightarrow n=1 \rightarrow f(r) = \sqrt[4]{1+r} = \boxed{1}$$

$$n+\sqrt{n}=4 \rightarrow n=5 \rightarrow f(4) = \sqrt[4]{4} + \sqrt[4]{5} = \boxed{\sqrt[4]{4} + \sqrt[4]{5}}$$

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

$$f(n-1) + f(1-n) = \boxed{0}$$

$$rf-g = r[\sqrt{a-n} + k-1] - [\sqrt{b-n} + rk] = 0$$

$$r\sqrt{a-n} + rk - r - \sqrt{b-n} - rk = 0 \rightarrow r\sqrt{a-n} - \sqrt{b-n} = r - k$$

$$\rightarrow r\sqrt{a-n} - \sqrt{b-n} = r - k \rightarrow r\sqrt{a-n} = \sqrt{b-n} + r - k$$

$$\star \begin{cases} a \rightarrow \sqrt{a-n} \rightarrow \sqrt{a-n} \geq 0 \rightarrow \boxed{n \leq a} \\ b \rightarrow \sqrt{b-n} \rightarrow \sqrt{b-n} \geq 0 \rightarrow \boxed{n \leq b} \end{cases} \rightarrow \boxed{n \leq 1}$$

$$\frac{3a-b}{r} - k = f - \frac{f}{r} - (-1) = f - \frac{f}{r} + 1 = \boxed{3}$$

$$rx+r \geq 1 \rightarrow rn \geq -r \rightarrow \boxed{n \geq -1} \quad D_g \cap D_f = [-1, 4] \star$$

$$m-n \geq 1 \rightarrow n \leq m \rightarrow \boxed{m=4} \quad g(x) = \sqrt{2(x)^2} = \sqrt{2} \sqrt{x^2}$$

$$f(x) = \sqrt{x^2} = x \rightarrow f(x) = \sqrt{4-x^2} \rightarrow \boxed{f(x) = \sqrt{4-x^2}}$$

$$m+n \wedge \sqrt{r} = r + v = \boxed{4 + 2\sqrt{2}}$$

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