

$$y = \sqrt{f(n) - n + 1} \Rightarrow f(n) - n + 1 \geq 0 \Rightarrow f(n) \geq n - 1$$

$$[n] \geq 1 \Rightarrow f_{n-1} \geq n - 1 \Rightarrow n \geq 0 \quad (1)$$

$$\hookrightarrow n \geq 0 \quad (2)$$

$$\Rightarrow n \geq 0 \quad (3)$$

$$\stackrel{(1) \vee (2)}{\Rightarrow} \left[-\frac{f}{f} + 0\right] \cup [0 + 0] = \left[-\frac{f}{f} + 0\right] = D_f$$

$$[n] \leq 1 \Rightarrow f_{n+1} \geq n - 1 \Rightarrow n \geq \frac{f}{f} \quad (1)$$

$$\hookrightarrow n \leq 0 \quad (2)$$

$$\Rightarrow \left[-\frac{f}{f} + 0\right] = P$$

$$\frac{f_{n+1}^2 + f_{n+1} + 1}{(f_{n+1})^2} = \frac{f(1 + f_{n+1} + f_{n+1}^2)}{(f_{n+1})^2} = \frac{f(f_{n+1})^2}{(f_{n+1})^2} \Rightarrow y = \frac{f}{f_{n+1}}$$

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

$$(f_{n+1})^2 \neq 0 \Rightarrow f_{n+1} \neq 0 \Rightarrow n \neq -\frac{1}{f}$$

$$D_g = \mathbb{R} = D_f \quad (1) \quad n \neq \pm 1 \Rightarrow \frac{f^2(n+1) - (n+1)}{n^2 - 1} = \frac{(n+1)(f^2 - 1)}{(n-1)(n+1)} = \frac{f^2 - 1}{n-1} \Rightarrow n+1 \leq n+1 \Rightarrow C_f$$

$$(2) \quad n = \pm 1 \rightarrow n = 1 \rightarrow g(1) = 1 + f \cdot f \rightarrow f(1) = \frac{f(1)+f}{1+f} = f \Rightarrow a+f = f(1+f) = f + f^2 \Rightarrow a = f^2$$

$$f(n) \cdot g(n) \hookrightarrow n = -1 \rightarrow g(-1) = -1 + f \cdot 1 \rightarrow f(-1) = \frac{f(-1)+f}{-1+f} = 1 \Rightarrow -a+f = -1+f \Rightarrow a = 1$$

$$g(n) = \frac{(n-1)(n+1)}{n^2 + an + b} = f(n) \cdot \frac{n+1}{n-1} \Rightarrow n^2 + an + b = (n-1)(n-1) = (n-1)^2$$

$$g: \mathbb{R} - \{1\} \rightarrow \mathbb{R} - \{1\} \Rightarrow C_f$$

$$a + b + c = (-1) + 1 + 1 = 1$$

$$n^2 + an + b = (n-1)^2 = n^2 - 2n + 1 \Rightarrow a = -2, b = 1$$

$$f(n+1) = ((n+1)-1)((n+1)-f) = n(n-f) = n^2 - fn + f$$

$$f(1-n) = ((1-n)-1)((1-n)-f) = (-n)(-n-f) = n^2 + fn - f$$

$$g(n) \cdot f(n+1) + f(1-n) = n^2 - fn^2 + fn - n^2 - fn - f = -1$$

$$L(r) - L(-1) \Rightarrow L(r) \Rightarrow 1 - r_n = r \Rightarrow n = -1 \Rightarrow L(r) = \sqrt[3]{-1} + r \checkmark$$

$$\downarrow$$

$$L(-1) \Rightarrow 1 - r_n = -1 \Rightarrow -r_n = -2 \Rightarrow n = 1 \Rightarrow L(-1) = \sqrt[3]{-1} \checkmark$$

$$1 + r = \checkmark$$

(r)

f

$$L(n+\sqrt{n}) = n^{\frac{1}{3}} + r_n \Rightarrow n \geq 0$$

$$L(4) \Rightarrow n + \sqrt{n} = 4 \xrightarrow{\sqrt{n}=t} t^2 + t - 4 = 0 \Rightarrow (t+4)(t-1) = 0 \Rightarrow \begin{cases} t_1 = 4 \checkmark \rightarrow \sqrt{n} = 4 \Rightarrow n = 16 \\ t_2 = -1 \text{ د جوف } \end{cases}$$

(r)

y

$$\xrightarrow{n=1} L(4) \cdot (1)^{\frac{1}{3}} + r(1) = \checkmark$$

$$L(n) = n^{\frac{1}{3}} + n \quad L(n-1) = (n-1)^{\frac{1}{3}} + (n-1)$$

$$\Rightarrow L(1-n) = (1-n)^{\frac{1}{3}} + (1-n) \Rightarrow -(n-1)^{\frac{1}{3}} - (n-1)$$

$$L(n-1) + L(1-n)$$

(r)

A

$$\downarrow$$

$$(n-1)^{\frac{1}{3}} + (n-1) - (n-1)^{\frac{1}{3}} - (n-1) = 0$$

$$L(n-1) + L(1-n) = \checkmark$$

$$D_{f \cdot g} = D_f \cap D_g \rightarrow D_f = \{n - \frac{1}{f} \mid n \in \mathbb{Z}\} \Rightarrow n \geq \frac{1}{f} a \Rightarrow D_f \cap D_g = \left[\frac{a}{f}, \frac{b}{f} \right]$$

$$D_g = \{b - \frac{1}{g} \mid n \in \mathbb{Z}\} \Rightarrow n \leq \frac{b}{f}$$

$$n=1 \text{ د جوف } \frac{a}{f}$$

(r)

q

$$f \cdot g = \{ (1, k) \}$$

$$(f \cdot g)(1) = f(1) \cdot g(1) = k \Rightarrow \sqrt[3]{1-k} - k = k \Rightarrow \sqrt[3]{1-k} = 2k \Rightarrow k = -1$$

$$n=1 \Rightarrow \frac{a}{f} = 1 \Rightarrow a = \frac{f}{1} \checkmark, \quad \frac{b}{f} = 1 \Rightarrow b = f \checkmark \mid \frac{a-b}{f} - k \Rightarrow \frac{f - \frac{f}{f}}{f} - (-1) = \frac{f-f}{f} + 1 = 1 \checkmark$$

$$D_{f \cdot g} = D_f \cap D_g \rightarrow D_g = \{m + 1 \mid m \in \mathbb{Z}\} \Rightarrow m \geq -1$$

$$D_f = \{m - n \mid m \in \mathbb{Z}\} \Rightarrow m \geq n$$

$$\Rightarrow D_g \cap D_f = [-1, m] = [-1, v] \Rightarrow m = v \checkmark$$

(r)

1.

$$(f \cdot g)(r) = f(r) \cdot g(r) = r\sqrt{r} \Rightarrow r + n - r\sqrt{r} = r\sqrt{r} \Rightarrow n = \sqrt{r} - r$$

$$\sqrt{r-r} + n = r + n \quad \sqrt{r(r)+r} = \sqrt{r}$$

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