

(1)

$$f(n) = \begin{cases} f(n-1); [n] > r \rightarrow [n] > r \rightarrow n > \omega \\ f(n+c); [n] \leq r \rightarrow [n] \leq r \rightarrow n < \omega \end{cases} \rightarrow g = \begin{cases} \sqrt{n} & n > \omega \\ \sqrt{r n + r} & n < \omega \end{cases}$$

$$\rightarrow D_{n \geq \omega} \rightarrow n \geq \omega, D_{n < \omega} = n \geq -\frac{r}{r} \rightarrow D = \left[-\frac{r}{r}, +\infty\right)$$

(2)

$$f(n) = \frac{r(rn+1)^r}{(rn+1)^r} \rightarrow f(n) = r(rn+1) \rightarrow D: n \neq -\frac{1}{r}$$

(3)

$$\left\{ \begin{array}{l} \frac{r^2 + r n^2 - n - r}{r^2 - 1}; n \neq \pm 1 \rightarrow \frac{(n-1)(n+1)(n+r)}{(n-1)(n+1)} \rightarrow n+r \rightarrow g(n) = n+r \\ \frac{a n + r}{n + b}; n = \pm 1 \end{array} \right. \rightarrow \boxed{c = r}$$

$$f(1) = \frac{a+r}{1+b} = r \rightarrow a+r = r+rb \rightarrow a+r = r+rb$$

$$f(r) = \frac{ra+r}{r+b} = 1 \rightarrow ra+r = r+b \rightarrow \underline{ra=b}$$

$$\begin{matrix} b \\ a = -\frac{1}{a} \\ b = -\frac{r}{\omega} \end{matrix}$$

$$\rightarrow b+c = r + -\frac{r}{\omega} = \frac{1}{\omega} = 1,9$$

(4)

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

$$\frac{(n+1)(n-1)}{(n+c)(n-1)} = \frac{(n+1)(n-1)}{n^r+an+b} \rightarrow n^r+an+b = (n-1)^r \rightarrow \underline{a=-r}, \underline{b=1}$$

$$\hookrightarrow \text{مطلوبه}$$

$$\boxed{c=1} \leftarrow \text{مطلوبه}$$

$$a+b+c = -r+1+1=0$$

(5)

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

$$D_g = \mathbb{R}$$

$$f(1) \rightarrow 1-rn+1 \rightarrow \underline{n=1} \rightarrow f(1) = \sqrt{1} = 1$$

$$f(r) \rightarrow 1-rn+c \rightarrow \underline{n=-1} \rightarrow f(r) = \sqrt{-1+r} = 1$$

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

$$f(1-rn) = \begin{cases} \sqrt{rn+r} & n \leq 1 \\ \sqrt{rn} & n > 1 \end{cases}$$

$$n + \sqrt{n+4} \rightarrow n+2$$

$$f(m+\sqrt{n}) = n^2 + m \quad (\checkmark)$$

$$\rightarrow f(4) = (4)^2 + 2(4) = 20 + 4 = 24 \quad (\textcircled{24})$$

$$f(m) = m^2 + m$$

$$f(m-1) + f(1-m)$$

(1)

$$\begin{aligned} \rightarrow f(m-1) &= (m-1)^2 + m-1 = m^2 - 2m + 1 + m - 1 = m^2 - m \\ \rightarrow f(1-m) &= (1-m)^2 + 1-m = 1 - 2m + m^2 + 1 - m = m^2 - 3m + 2 \end{aligned} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \rightarrow$$

$$\$ f(m-1) + f(1-m) = 0$$

$$g(m) = \sqrt{b - 2m + 2k}$$

$$f(m) = \sqrt{m - 2a} + k - 1$$

(4)

استاد دامنه را برای یک عدد است و همچنین ضریب x در زیر رادیکال قرینه است $\leftarrow b = 2a$

$$g(m) = \sqrt{2a - 2m + 2k}, f(m) = \sqrt{m - 2a} + k - 1$$

از زیر رادیکال را فرضی کنه $\leftarrow \frac{b}{2} = a \rightarrow a = \frac{b}{2}$

$$\rightarrow f(m) = \sqrt{m - 2a} + k - 1, g(m) = \sqrt{2a - 2m + 2k}$$

$$\rightarrow 2f(1) - g(1) = 2k - 2 - 2k = -2 = k \rightarrow \boxed{k = -1}$$

$$2a = \frac{b}{2} = k \rightarrow 2\left(\frac{k}{2}\right) + \frac{k}{2} = (-1) \cdot k + 2 + 1 = 3 \quad (\textcircled{3})$$

$$g = \sqrt{2m+2}$$

$$f = \sqrt{m-2} + n$$

$$D_{f \times g} = [-1, 5]$$

(1)

اول بازه از تابع g به دست آوریم m و n فرض کنیم: f به دست آوریم n و m فرض کنیم $\leftarrow$

$$g = \sqrt{2m+2}$$

$$f = \sqrt{m-2} + n$$

$$\boxed{m=5}$$

$$f = g(r), 4\sqrt{r} \rightarrow f(r) = r + n, g(r) = \sqrt{r} = 2\sqrt{r}$$

$$\rightarrow r + n = 1\sqrt{4} \cdot 4\sqrt{r} \rightarrow \boxed{n = -5 + 4\sqrt{r}}$$

$$\rightarrow m + n = 5 - 5 + 4\sqrt{r} = \boxed{4\sqrt{r}}$$