

كسائر موجبة

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

$f(n) = \begin{cases} n-1 & ; [n] > 1 \rightarrow n \geq 0 \\ n-1^2 & ; [n] \leq 1 \rightarrow n < 0 \end{cases}$

$n \geq 0 \rightarrow n-1-n+1 \geq 0 \rightarrow 0 \geq 0 \rightarrow n \geq 0$

$n < 0 \rightarrow n-1^2-n+1 \geq 0 \rightarrow n^2 \geq -n \rightarrow n \geq -\frac{n}{n} \rightarrow n \geq -1$

$\rightarrow D_y = [-\frac{1}{n}, +\infty)$

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

$= \frac{1^2}{1n+1} \rightarrow 1n+1 \neq 0 \rightarrow n \neq -\frac{1}{1} \rightarrow D_f = \mathbb{R} - \{-\frac{1}{1}\}$

3) $f(n) = \begin{cases} \frac{n^2 + 1n^2 - a - 1}{n^2 - 1} & ; n \neq \pm 1 \\ \frac{a+1}{a+b} & ; n = \pm 1 \end{cases}$

$g(n) = n + c$

$n = 0 \rightarrow f(0) = \frac{0+0-a-1}{0-1} = \frac{-a-1}{-1} = a+1 \rightarrow g(0) = 0+c = a+1$

$g(n) = n + 1$

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

$g(1) = 1+1 = 2$

$n = -1 \rightarrow f(-1) = \frac{-a+1}{b-1} \rightarrow \frac{-a+1}{b-1} = -1 \rightarrow -a+1 = -b+1 \rightarrow b = a$

$g(-1) = -1+1 = 0$

$\left. \begin{matrix} b-a = 0 \\ b+a = 2 \end{matrix} \right\} \rightarrow \begin{matrix} b = 1 \\ a = 1 \end{matrix}$

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

1) $\rightarrow (n-c)^2 = n^2 + an + b$

2) $\frac{n+1}{n-c} = \frac{n^2-1}{(n-c)(n-1)}$

1) $\rightarrow (n-c)(n-1) = (n-c)^2 = n^2 + an + b$

$n-c, n-1 \rightarrow c=1$

$n^2 + an + b = n^2 + 1n + 1 \rightarrow a=1, b=1$

$a+b+c = 1+1+1 = 3$

$$\begin{aligned}
 \omega) \quad & f(n), (n-1)^r (n-1) \quad f(n+1), p(n) = (n+1)^r (n+1) + (1-n)^r (1-n-1) \\
 & = (n-1)^r (n) + (1-n)^r (-n) = (n^r - r n^{r-1} + \dots) - (1 - r n + \dots)(-n) \\
 & = n^r - r n^{r-1} + \dots - n^r + r n^{r-1} - \dots = 0
 \end{aligned}$$

$$\begin{aligned}
 4) \quad & f(1-n), \begin{cases} \sqrt{x} + 1 & n \leq 0 \\ \sqrt{x} & n > 0 \end{cases} \quad f(-1) + f(1) = 1 + 1 = 2 \\
 & f(1-n) = \sqrt{1-n} + 1 \quad n \leq 0 \quad \sqrt{1-n} = \sqrt{1-(-1)} = \sqrt{2} \\
 & f(1) = \sqrt{1} = 1
 \end{aligned}$$

$$f(-1) \Rightarrow 1-n = -1 \Rightarrow 1-r \Rightarrow n = 1 \Rightarrow f(-1) = \sqrt{1} = 1$$

$$f(1) \Rightarrow 1-n = 1 \Rightarrow 1-r \Rightarrow n = 0 \Rightarrow f(1) = \sqrt{1} = 1$$

$$\begin{aligned}
 5) \quad & f(n + \sqrt{n}) = n^r + \sqrt{n} \quad f(4) \rightarrow 4 + \sqrt{4} = 4 + 2 = 6 \\
 & f(4) = \frac{4^r}{r} + \frac{1}{2} \cdot 4 = \frac{4^r}{r} + 2 \\
 & f(4) = 6 \Rightarrow \frac{4^r}{r} + 2 = 6 \Rightarrow \frac{4^r}{r} = 4 \Rightarrow 4^r = 4r \Rightarrow r = 1
 \end{aligned}$$

$$\begin{aligned}
 6) \quad & f(n) = n^r + n \\
 & f(n-1) + f(1-n) = (n-1)^r + (n-1) + (1-n)^r + (1-n) = 0 \\
 & n^r - r n^{r-1} + \dots + n - 1 + 1 - n + r n^{r-1} - \dots + 1 - n = 0
 \end{aligned}$$

$$\begin{aligned}
 7) \quad & f(n), \sqrt{kx - ka} + k - 1 \quad f(1), \sqrt{k - ka} + k - 1 \\
 & g(n), \sqrt{b - km} + k \quad g(1), \sqrt{b - k} + k \\
 & f - g = \{C, k\} \rightarrow f(1) - g(1), \sqrt{k - ka} + k - 1 - \sqrt{b - k} - k = 0 \\
 & k - ka = 0 \Rightarrow a = \frac{k}{r} \\
 & b - k = 0 \Rightarrow b = k \\
 & k - k = 0 \Rightarrow k = 1 \\
 & ka = \frac{b}{r} = k \Rightarrow \frac{k}{r} = k \Rightarrow r = 1
 \end{aligned}$$

$$\begin{aligned}
 8) \quad & f(n), \sqrt{m-n} + n \quad g(n), \sqrt{n+1} \quad D_{f+g} = [-1, 1] \\
 & D_{f+g} = D_f \cup D_g = [-1, +\infty) \cup D_g = [-1, 1] \rightarrow D_g = [-1, 1] \rightarrow m-n \geq 0 \rightarrow m \geq n \\
 & f - g = \sqrt{m-n} + n - \sqrt{n+1} = 0 \\
 & \sqrt{m-n} + n = \sqrt{n+1} \Rightarrow n = \sqrt{n+1} - \sqrt{m-n} \\
 & m + n = 1 + \sqrt{n+1} - \sqrt{m-n} = 1 + \sqrt{n+1}
 \end{aligned}$$