

$$f(n) = \sqrt{n+1}\sqrt{n-1} = \sqrt{n-1} + 1 \quad g(n) = \sqrt{n-1}\sqrt{n-1} = |\sqrt{n-1} - 1| = \sqrt{n-1} - 1 \quad n \geq 1$$

$$f(n) + g(n) = a + b\sqrt{n+c} = \sqrt{n-1} + 1 + \sqrt{n-1} - 1 = 0 + 2\sqrt{n-1}$$

$$\frac{a+b}{c} = \frac{1}{-1} = -\frac{1}{1}$$

$$\frac{g}{f} = ? \quad g(n) = \{(1,1), (1,0), (1,1), (0,1)\} \quad f(n) = \frac{n+1}{n^2-1n+1}$$

$$\frac{g}{f} = \{(1, \frac{1}{1-1+1}), (1, \frac{0}{1-1+1}), (1, \frac{1}{1-1+1}), (0, \frac{1}{0-0+1})\}$$

$$g(n) = \{(-1,1), (1,-1), (1,1), (1,0)\} \quad f(n) = \{(1,1), (1,-1), (1,1), (1,0)\}$$

$$f(n) = \{(\frac{1}{1}, 1), (\frac{1}{1}, -1), (1, 1), (-\frac{1}{1}, 1)\}$$

$$f(n^2) = \{(1,1), (-1,1), (\sqrt{1}, -1), (-\sqrt{1}, -1), (1,1), (-1,1)\}$$

$$2g'(n) + 1 = \{(-1,1), (1,1), (1,1), (-1,1)\} \quad \frac{1}{g} = \{(1,-1), (1,-1)\}$$

$$\frac{1}{g} = \{(-1, \frac{1}{1}), (1, \frac{1}{1}), (1, \frac{1}{1})\}$$

$$f(n) = \{(1,1), (1,1), (1,1), (-1,0)\} \quad g = \{(0,1), (1,1), (1,1), (-1,1), (1,1)\}$$

$$h = 1f + g = \{(1,1), (1,1), (-1,1)\}$$

$$f(n) = \sqrt{13n-n} \quad g(n) = [n] + [-n]$$

$$[0, 13] \quad n-1 \rightarrow n+1 \quad \left(\frac{f}{g+1}\right)n \quad n \in \mathbb{Z}$$

$$D = \{0, 1, 13\}$$

$$f(n) = \sqrt{-n^2 + 2n - 1}$$

$$g(n) = \{(1, 1), (1, 1), (1, 1), (0, 1)\}$$

$$h(n) = \frac{f(n)}{g(n)} = \left\{ \left( \frac{1}{1}, \frac{0}{1} \right), \left( \frac{1}{1}, \frac{\sqrt{1}}{1} \right), \left( \frac{1}{1}, \frac{0}{1} \right), \left( \frac{0}{1}, \frac{\sqrt{1}}{1} \right) \right\}$$

$$= \{(1, 0), (1, \sqrt{1}), (1, 0)\}$$

الف)  $y \cdot n^3 - n^3 + n = n^3 - n^3 + n - 1 + 1 = (n-1)^3 + 1 = y$   $R_f = \mathbb{R}$

$n-1 = \sqrt[3]{y-1}$   $n = \sqrt[3]{y-1} + 1$   $y \in \mathbb{R}$

ب)  $y = \frac{1}{n^2 - 2n}$   $y n^2 - 2n y - 1 = 0$   $n = \frac{2y \pm \sqrt{4y^2 + 4}}{2}$

$R = (-\infty, -1] \cup [1, +\infty)$   $y(y+1) \geq 0$

الف)  $n^2 - 5n + 4 = y$   $\min\left(-\frac{b}{2a}, y\right) = (1, 4)$   $R = [4, +\infty)$

$R - 1 + 1 = y$

ب)  $-n^2 + 4n + 1 = y$   $-\frac{b}{2a} = \max(1, 4)$   $R = (-\infty, 1]$

ج)  $\sqrt{n^2 - 5n - 3} = y$   $\min(1, -1) = -1$   $R_{n^2-5n-3} = [-1, +\infty)$   $R_f = [0, +\infty)$

د)  $\sqrt{-n^2 + 4n} = y$   $\max(0, 4) = 4$   $R_{-n^2+4n} = (-\infty, 4)$   $R_f = [0, 4]$

الف)  $y = n^3 - 2n^2 + n + 1$   $\mathbb{R}$

ب)  $y = n^3 - 4n^2 + n + 1$   $\mathbb{R}$

ج)  $y = \sqrt{n^3 - 4n^2 + 2n + 1}$   $R_{+,0} = [0, +\infty)$

د)  $y = (n^3 - 5n^2 + n + 1)^2 = R_f = [0, +\infty)$

$R$  عبارت با قدر کمتر از 1 است

$y = \frac{n+1}{n^2}$   $R = \left\{ \frac{1}{c} \right\}$   $R = \{1\}$

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