

$$f(n) = \begin{cases} 2n-1 & : [n] > 4 \rightarrow \underline{n \geq 5} \\ \varepsilon n + 3 & : [n] \leq 4 \rightarrow \underline{n \leq 4} \end{cases} \Rightarrow y = \sqrt{f(n) - n + 1} \rightarrow f(n) - n + 1, .$$

$$\rightarrow \boxed{n \geq 5} : 2n-1 - n + 1 \geq 0 \rightarrow \boxed{n \geq 0} \Rightarrow \boxed{n \geq 5}$$

$$\rightarrow \boxed{n \leq 4} : \varepsilon n + 3 - n + 1 \geq 0 \rightarrow \varepsilon n + 4 \geq 0 \rightarrow \boxed{n \geq -\frac{4}{\varepsilon}} \Rightarrow \boxed{-\frac{4}{\varepsilon} \leq n \leq 4} \Rightarrow D_y = [-\frac{4}{\varepsilon}, +\infty)$$

$$y = \frac{\varepsilon \varepsilon n^2 + \varepsilon n^2 + 12n + 3}{(\varepsilon n^2 + \varepsilon n + 1)^2} = \frac{\varepsilon \times (1n^2 + 4n^2 + 7n + 1)}{(n+1)^4} = \frac{\varepsilon \times (n+1)^2}{(n+1)^4} = \frac{\varepsilon}{n+1}$$

$$D_y \Rightarrow \text{خرج} \neq 0 \rightarrow n+1 \neq 0 \rightarrow n \neq -\frac{1}{\varepsilon} : D_y = \mathbb{R} - \{-\frac{1}{\varepsilon}\}$$

$$f(n) = \begin{cases} \frac{n^2 + \varepsilon n^2 - n - \varepsilon}{n^2 - 1} & : n \neq \pm 1 \\ \frac{a + \varepsilon}{n + b} & : n = \pm 1 \end{cases} \Rightarrow f(n) = g(n) : 1) \underline{n=1} : \frac{a + \varepsilon}{b + 1} = 1 + c$$

$$g(n) = n + c \rightarrow 2) \underline{n=-1} : \frac{-a + \varepsilon}{b - 1} = c - 1$$

$$\Rightarrow a + \varepsilon = 1 + b + c + bc \rightarrow a = b + c + bc - 1$$

$$\rightarrow -a + \varepsilon = 1 - b - c + bc \rightarrow a = b + c - bc + 1 \quad \left. \begin{array}{l} b + c + bc - 1 = b + c - bc + 1 \\ \varepsilon bc = \varepsilon \rightarrow \boxed{bc = 1} \end{array} \right\} \rightarrow \begin{array}{l} b \times \varepsilon = 1 \\ \boxed{b = \frac{1}{\varepsilon}} \end{array} \Rightarrow b + c = \varepsilon + \frac{1}{\varepsilon} = \varepsilon + \frac{1}{\varepsilon} = \frac{\varepsilon^2 + 1}{\varepsilon}$$

$$f(n) = \frac{n+1}{n-c} \Rightarrow \underline{n=0} : \frac{1}{-c} = \frac{\varepsilon}{b} \Rightarrow \boxed{b=c}$$

$$g(n) = \frac{n^2 - 1}{n^2 + an + b} \rightarrow \underline{n=1} : \frac{\varepsilon}{1 - c} = 0 \rightarrow \varepsilon = 0 \text{ دقت کنید } \Rightarrow \text{مخرجی که } n=1 \text{ در آن صفر شود} \Rightarrow D_f = D_g$$

$$\Rightarrow f(n) : 1 - c = - \rightarrow \boxed{c=1} \rightarrow \boxed{c=b=1} \quad \left. \begin{array}{l} \Rightarrow g(n) : 1 + a + b = 0 \rightarrow \boxed{a=-2} \\ a + b + c = -2 + 1 + 1 = 0 \end{array} \right\}$$

$$f(n) = (n - \varepsilon)^r (n - 1) \Rightarrow g(n) = f(n+1) + f(1-n) : g(n) = (n+1 - \varepsilon)^r (n+1-1) + (1-n - \varepsilon)^r (1-n-1)$$

$$\Rightarrow g(n) = (n - \varepsilon)^r \times n + (n + \varepsilon)^r \times -n \rightarrow g(n) = n(n^r - \varepsilon n^r + \varepsilon n^r - \varepsilon n^r) = -1n^r$$

$$\Rightarrow g(n) = -1n^r$$

$$f(1-x) = \begin{cases} \sqrt{x} + x & : x \leq 0 \\ \sqrt{x} & : x > 0 \end{cases} \rightarrow f(-1) + f(x) = ? : 1-x = -1 \rightarrow -x = -2 \rightarrow \underline{x=1}$$

$$\Rightarrow \underline{x=1} : \sqrt{1} = 1 : f(-1) / 1-x = 2 \rightarrow -x = 2 \rightarrow \underline{x=-1}$$

$$\Rightarrow \underline{x=-1} : \sqrt{-1} + x = 1 : f(x) \Rightarrow f(-1) + f(x) = 1 + 1 = 2$$

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$$f(x+\sqrt{x}) = x^2 + x \rightarrow f(x) = ? : x+\sqrt{x} = y : \sqrt{x} = t \rightarrow x = t^2 \rightarrow t^2 + t = y \rightarrow t^2 + t - y = 0 \rightarrow -t = \sqrt{y} \text{ (Göe)} \rightarrow t = -\sqrt{y} \rightarrow x = y$$

$$\Rightarrow (x) + x(x) = x^2 + x^2 = 2x^2$$

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$$f(x) = x^3 + x \rightarrow f(x-1) + f(1-x) \stackrel{\text{sol}}{=} (x-1)(x^2-x+1) + (1-x)(x^2-x+1) = (x^2-x+1)(x-x+1-x) = 0$$

$$\hookrightarrow x(x^2+1)$$

$$\underline{\text{b:}} \text{ (sol)} (x-1)^3 + (x-1) + (1-x)^3 + (1-x) = x^3 - 3x^2 + 3x - 1 + x - 1 + 1 - 3x^2 + 3x - 1 + 1 - x + x^3 = 2x^3 - 6x^2 + 6x - 2$$

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$$f(x) = \sqrt{x-a} + k-1 \rightarrow x-a \geq 0 \rightarrow x \geq \frac{a}{2} \Rightarrow 2f-g = \{(1, k)\}$$

$$g(x) = \sqrt{b-x} + k \rightarrow b-x \geq 0 \rightarrow x \leq \frac{b}{2} \rightarrow \left[\frac{a}{2}, \frac{b}{2} \right] \rightarrow \begin{cases} \frac{a}{2} = 1 \rightarrow a = 2 \\ \frac{b}{2} = 1 \rightarrow b = 2 \end{cases}$$

$$\hookrightarrow 2f(1) - g(1) = k : 2(\sqrt{1-a} + k-1) - (\sqrt{b-1} + k) = k \rightarrow 2k - 2 - k = k \rightarrow k = -1$$

$$\Rightarrow -k-2 = k \rightarrow k = -2 \rightarrow \underline{k=-1} : a - \frac{b}{2} - k = ? : 2 - \frac{2}{2} - (-1) = 1 - (-1) = 2$$

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$$f(x) = \sqrt{m-x} + x \rightarrow D_{fg} = [-1, \sqrt{m}] \Rightarrow m-x \geq 0 \rightarrow x \leq m$$

$$g(x) = \sqrt{x+1} \rightarrow x+1 \geq 0 \rightarrow \underline{x \geq -1} \rightarrow \underline{m=1}$$

$$\Rightarrow f-g(x) = \sqrt{m-x} + x - \sqrt{x+1} = 1 + x - \sqrt{x+1} = 1 + \sqrt{x} \rightarrow \underline{m=1+\sqrt{x}}$$

$$m+x = 1+\sqrt{x}+0$$

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