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

$$f(n) = \begin{cases} 2n-1 & n \geq 0 \\ 5n+3 & n < 0 \end{cases}$$

$$f(n) - n + 1 \geq 0 \quad (1) \quad \text{if } n \geq 0 \Rightarrow n \geq 0 \Rightarrow n \in [0, +\infty)$$

$$\text{if } n < 0 \Rightarrow 5n+3 \geq 0 \Rightarrow n \geq -\frac{3}{5} \Rightarrow n \in [-\frac{3}{5}, 0)$$

$$\Rightarrow D_g: [-\frac{3}{5}, +\infty) \checkmark$$

$$\frac{25n^2 + 54n^2 + 18n + 3}{(5n^2 + 5n + 1)^2} = \frac{3(12n^2 + 12n^2 + 6n + 1)}{(5n^2 + 5n + 1)^2} = \frac{(2n+1)^2 + 2}{(5n+1)^2}$$

$$= \frac{3}{5n+1}$$

$$D: n \neq -\frac{1}{5} \quad \mathbb{R} - \{-\frac{1}{5}\}$$

$$= \frac{3}{5n+1}$$

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

$$g(n) = n+c \quad \checkmark$$

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

$$\frac{a+2}{1+b} = \frac{a+2}{2} \Rightarrow a+2 = 2(1+b) \Rightarrow a+2 = 2+2b \Rightarrow a = 2b$$

$$\frac{-a+2}{-1+b} = \frac{-a+2}{b-1} = \frac{2-2b+2}{b-1} = \frac{4-2b}{b-1} = \frac{2(2-b)}{b-1}$$

$$\Rightarrow b+c = 1/0$$

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

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

$$\text{چون } b \neq 0 \text{ و } a \neq 0 \text{ پس } c=1 \checkmark$$

$$\Rightarrow a=-2 \quad b=1$$

$$a+b+c = 1+1+(-2) = 0 \checkmark$$

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

$$f(n+1) = (n-2)^2(n) = n^3 - 4n^2 + 4n$$

$$f(1-n) = (n+2)^2(-n) = -n^3 - 4n^2 - 4n$$

$$\Rightarrow g(n) = -1/n^2$$

$$f(1-2n) = \begin{cases} \sqrt{n} + 1 & n \leq 0 \\ \varepsilon \sqrt{n} & n > 0 \end{cases}$$

$$1-2n = 3$$

$$2n = -2 \quad n = -1 \Rightarrow f(3) = 1$$

$$1-2n = -1$$

$$2 = 2n \quad n = 1 \Rightarrow f(-1) = \varepsilon$$

$$\Rightarrow f(1) + f(2) = 2$$

$$f(n + \sqrt{n}) = n^{\varepsilon} + \sqrt{n}$$

$$f(9) = ?$$

$$9 = n + \sqrt{n} \Rightarrow n = 4 \Rightarrow n^{\varepsilon} + \sqrt{n} = 4^1 + 1^2 = 5$$

$$f(n) = n^{\varepsilon} + n$$

$$f(n-1) = -f(n+1)$$

$$\Rightarrow f(n-1) + f(n+1) = 0$$

$$f(-n) = -n^{\varepsilon} - n \Rightarrow f(n) = -f(-n)$$

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

$$D_f: \left[\frac{2a}{\varepsilon}, +\infty \right)$$

$$g(n) = \sqrt{b - \varepsilon n} + \sqrt{h}$$

$$D_g: (-\infty, \frac{b}{\varepsilon}]$$

$$D_f \cap D_g = \{1\} \Rightarrow \frac{2a}{\varepsilon} = \frac{b}{\varepsilon} = 1 \quad b = \varepsilon \quad a = \frac{\varepsilon}{2}$$

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

$$2k = -2 \quad k = -1$$

$$2a = \frac{b}{\varepsilon} = k = -1$$

$$f(n) = \sqrt{m-n} + n$$

$$D_f: (-\infty, m]$$

$$g(n) = \sqrt{1+n}$$

$$D_g: [-1, +\infty)$$

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

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

$$\Rightarrow n = 1 \quad m = 2$$