

$$f(x) = \begin{cases} (a+1)(x+2) & x > 1 \\ 3a + 2x & x \leq 1 \end{cases}$$

$$2f(1) = f(-1) + a \rightarrow 2(3a+2) = 3a-1+a \rightarrow 6a+4 = 4a-1 \rightarrow 2a = -5 \rightarrow a = -\frac{5}{2}$$

1/5

$$a = 1/18$$

$$f(x) = \sqrt{x} + \frac{1}{\sqrt{x}} + 2 \rightarrow$$

$$f(2+\sqrt{2}) \rightarrow \sqrt{2+\sqrt{2}} + \frac{1}{\sqrt{2+\sqrt{2}}} + 2 \rightarrow \frac{\sqrt{2}+1}{\sqrt{2}} + \frac{\sqrt{2}-1}{\sqrt{2}} + 2$$

$$f(2-\sqrt{2}) \rightarrow \sqrt{2-\sqrt{2}} + \frac{1}{\sqrt{2-\sqrt{2}}} + 2 \rightarrow \frac{\sqrt{2}-1}{\sqrt{2}} + \frac{\sqrt{2}+1}{\sqrt{2}} + 2$$

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

$$\frac{1}{\sqrt{2}+\sqrt{2}} = \frac{\sqrt{2}-\sqrt{2}}{\sqrt{1}} = \frac{\sqrt{2}-1}{\sqrt{2}}$$

$$\frac{1}{\sqrt{2}-\sqrt{2}} = \frac{\sqrt{2}+\sqrt{2}}{1} = \frac{\sqrt{2}+1}{\sqrt{2}}$$

$$\rightarrow 2f(x) - 3f(-x) = \epsilon x^2 - x \xrightarrow{\times 2} 4f(x) - 6f(-x) = 2\epsilon x^2 - 2x$$

$$\rightarrow 2f(-x) - 3f(x) = \epsilon x^2 + x \xrightarrow{\times 3} 6f(-x) - 9f(x) = 3\epsilon x^2 + 3x$$

$$-5f(x) = 2\epsilon x^2 + x \rightarrow f(x) = -\frac{\epsilon x^2}{5} - \frac{x}{5}$$

$$(x+2)f(x) - 3xf(x+2) = \epsilon x^2 - mx + 3m-1$$

$$\frac{1\omega + 2m}{x} = \frac{3m-1}{x}$$

$$x \rightarrow -2 \Rightarrow -3(-2)f(0) = 14 + 2m + 3m - 1 \rightarrow 6f(0) = 13 + 5m$$

$$x \rightarrow 0 \Rightarrow 2f(0) = 3m-1 \rightarrow f(0) = \frac{3m-1}{2}$$

$$f(0) = \frac{2\epsilon}{5}$$

$$f(x) + f\left(\frac{1}{x}\right) = \frac{3x^2 - 12x + 3}{x}$$

$$ax+b + \frac{a}{x} + b = \frac{3x^2 - 12x + 3}{x}$$

$$f(-1) =$$

$$\frac{ax^2 + bx + a}{x} \rightarrow \begin{cases} a = 3 \\ b = -9 \end{cases}$$

$$f(x) = 3x - 9 \rightarrow f(-1) = -9$$

$f(x) = (x-1)\sqrt{1-x} \rightarrow \sqrt{(x-1)^2(1-x)} = \sqrt{(1-x)^3} \rightarrow x \leq 1$ $g(x) = -\sqrt{1-x}^3 \rightarrow D_f \subset \mathbb{R}$ $D_g \rightarrow (1-x)^3 \rightarrow 1-x \geq 0 \rightarrow x \leq 1 \rightarrow D_g = (-\infty, 1] \rightarrow D_f = D_g$ (1/25)	٤
$f(x) = x\sqrt{x} \rightarrow x \geq 0$ $g(x) = \sqrt{x} \rightarrow x \sqrt{x}$ $D_f = [0, +\infty)$ تساوی	٧
$f(x) = [\sqrt{x} - [\sqrt{x}]] \rightarrow x \geq 0$ $g(x) = \sqrt{x - x } \rightarrow x - x \geq 0 \rightarrow x \leq x \rightarrow [0, +\infty) \rightarrow 0 \text{ تابع}$ تساوی	٨
$g = \{(\sqrt{2}, 1), (-1, 1), (2, 3), (3, 2), (0, 2)\} \quad f = \{(1, 2), (2, 3), (3, 1), (0, 0)\}$ الف) $\left[\frac{f+g}{f-g}\right](1) \rightarrow \frac{2+1}{2-1} = 3$ ب) $\left[\frac{f+g}{f-g}\right](2) \rightarrow \frac{2+3}{2-3} = \frac{5}{-1} = -5$ ج) $f(0)g(-1) \rightarrow 0 \times 1 = 0$	٩
$g(x) = f(x-1) \rightarrow g = \left\{ \left(\frac{1}{2}, 1\right), (0, 2), \left(\frac{1}{2}, 0\right), \left(-\frac{1}{2}, 2\right), \left(\frac{3}{2}, -1\right) \right\}$ $x-1 = 2 \rightarrow 1 \quad x-1 = -2 \rightarrow -\frac{1}{2}$ $x-1 = 1 \rightarrow 0 \quad x-1 = 2 \rightarrow \frac{3}{2}$ $x-1 = 0 \rightarrow \frac{1}{2} \quad x-1 = 3 \rightarrow \frac{4}{2}$ $h(x) = f(x) \rightarrow h = \{(2, 1), (-2, 1), (0, 0), (3, -1), (-3, -1)\}$	١٠

$$f(n) = \begin{cases} (a+1)(n+2) & ; n > 1 \\ 3a+2n & ; n \leq 1 \end{cases}$$

$$2f(1) = f(-1) + a$$

$\downarrow$ ضابطه‌ی پایینی $\downarrow$ ضابطه‌ی بالایی

(1)

$$2[(a+1)(1+2)] = 3a + 2(-1) + a \rightarrow 14a + 14 = 4a - 2 \rightarrow 10a = -16 \rightarrow \boxed{a = -1.6}$$

$$f(n) = (n-1)\sqrt{1-n} \rightarrow Df = 1-n \geq 0 \rightarrow n \leq 1 \rightarrow Df = (-\infty, 1]$$

$$g(n) = -\sqrt{(1-n)^3} \rightarrow Dg = (1-n)^2 \geq 0 \rightarrow n \leq 1 \rightarrow Dg = (-\infty, 1]$$

(4)

(دامنه‌ها) شرط اول برقرار است! $Df \subseteq Dg$ ✓

$$g(n) = -\sqrt{(1-n)^3} = -\sqrt{(1-n)^2(1-n)} = -|1-n|\sqrt{1-n} \xrightarrow{n \leq 1} -(1-n)\sqrt{1-n} = (n-1)\sqrt{1-n}$$

$$f(n) = g(n) \text{ ✓ (ضابطه‌ها) شرط دوم برقرار است!} \rightarrow \boxed{f(n) = g(n)}$$