

$$2f(0) = f(-1) + a$$

$$f(0) \rightarrow 0 > -1 \rightarrow f(0) = (a+1)(0+1) = 1 + 1a$$

$$f(-1) \rightarrow -1 < 1 \rightarrow 3a + f(-1) = 3a - 1$$

$$2(1+a) = 3a - 1 + a \quad -1a = -1 \Rightarrow a = 1$$

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$$\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2 \rightarrow x + \frac{1}{x} + 2$$

$$\sqrt{x} + \frac{1}{\sqrt{x}} = A$$

$$A^2 = x + \frac{1}{x} + 2$$

$$A = \sqrt{x + \frac{1}{x} + 2}$$

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

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

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

$$(\sqrt{4+x})(\sqrt{4+x}) = 4+x$$

$$2\sqrt{4+x}$$

$$f(x+\sqrt{x}) \rightarrow \sqrt{4+x} + 2 \rightarrow \sqrt{4+x} + 2$$

$$f(x-\sqrt{x}) = \sqrt{4-x} + 2 + \sqrt{4-x} + 2$$

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$$(2f(x) - 3f(-x) = 5x^2 - x) \times 2 \rightarrow 4f(x) - 6f(-x) = 10x^2 - 2x$$

$$2 - 9f(x) + 4f(-x) = 10x^2 + 10x$$

$$2f(-x) - 3f(x) = 5x^2 + x \rightarrow$$

$$-8f(x) = 10x^2 + x \rightarrow f(x) = -\frac{5}{4}x^2 - \frac{1}{8}x$$

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$$\lim_{x \rightarrow \frac{9}{4}} \left(\frac{f(x)}{x} \right) - 1 = \frac{\frac{9}{4} - 1}{\frac{9}{4}} = \frac{\frac{5}{4}}{\frac{9}{4}} = \frac{5}{9} \Rightarrow f(0) = \frac{5}{9}$$

$$f(0) = \frac{5}{9}$$

$$9m - 3, 0m + 10$$

$$m = \frac{5}{9}$$

$$0 \rightarrow 2f(0) = 0 = 3m - 1$$

$$2f(0) = 3m - 1$$

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

$$x = -1 \rightarrow (-1+1)f(-1) = 0(-1)f(-1+1) = 0(-1) = 0 = m(-1) + 3m - 1$$

$$4f(0) = 2(0) + 0m - 1$$

$$4\left(\frac{3m-1}{2}\right) = 0m + 10$$

$$4f(0) = 0m + 10$$

$$4f(0) = 10 \Rightarrow 0m - 1 = 10$$

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$$f(x) = ax + b$$

$$f(x) + f\left(\frac{1}{x}\right) = (ax+b) + \left(a\frac{1}{x} + b\right) = \frac{ax^2 + 2bx + a}{x} \leftrightarrow \frac{3x^2 - 11x + 3}{x}$$

$$f(x) = 3x - 4$$

$$f(-1) = -9$$

$$a = 3$$

$$2b = -11, b = -\frac{11}{2}$$

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$1-x \geq 0 \rightarrow x \leq 1 \quad D_f, (-\infty, 1]$ $(1-x)^3 \geq 0 \rightarrow x \leq 1 \rightarrow D_g, (-\infty, 1]$ $(x-1)\sqrt{1-x} \rightarrow x \leq 1$ $f(-1), g(-1) = -1$ $(x-1), \ominus \sqrt{(1-x)^2}$ $(x-1)\sqrt{1-x}, (-\sqrt{1-x})^2 \cdot \sqrt{1-x}$ $= \sqrt{(1-x)^2 \cdot (1-x)} = -\sqrt{(1-x)^3}$	۶
$f(x) \rightarrow x \geq 0 \quad D_f, [0, +\infty)$ $g(x) \rightarrow x^3 \geq 0 \quad x \geq 0 \rightarrow D_g, [0, +\infty)$ $x \geq 0 \rightarrow \sqrt{x^3}, \sqrt{x^3} \cdot x, x \sqrt{x} \rightarrow \boxed{x\sqrt{x} = f(x)}$ $g(x)$	۷
$f(x)\sqrt{x} \rightarrow x \geq 0$ $+ - [+] \rightarrow [0, 1)$ $g(x) = \sqrt{x- x } \begin{cases} x \geq 0 \checkmark \\ x \leq 0 \checkmark \\ x \geq 0 \checkmark \end{cases} \quad D_g, [0, +\infty)$ $x \geq 0 \rightarrow x - x = 0$ $g(x) = \sqrt{0} = 0$ $f(x), g(x) = 0$	۸
$D_f = \{0, 1, 2, 3\}$ $D_g = \{-1, 1, 0, 2, 3, \sqrt{5}\}$ ب) $f(2) = 3, g(2) = 3$ $\frac{2+3}{2-3}, (\frac{5}{-1}) \rightarrow \infty$ ج) $f(0) = 0, g(-1) = 1$ $0 \times 1 = 0$	۹
الف) $g(x) = f(\frac{1}{2} - 1)$ $\frac{1}{2}x - 1 = 0 \rightarrow x = \frac{1}{2}$ $(\frac{1}{2}, 0)$ $\frac{1}{2}x - 1 = -2 \rightarrow x = -\frac{1}{2}$ $(-\frac{1}{2}, 2)$ $\frac{1}{2}x - 1 = 3$ $x = \frac{7}{2}$ $(\frac{7}{2}, -1)$ الف) $\{(1, 1), (0, 4), (\frac{1}{2}, 0), (-\frac{1}{2}, 2), (\frac{7}{2}, -1)\}$ ب) $\{(2, 1), (-2, 1), (0, 0), (2, -1), (-2, -1)\}$ $ x = -1, -2$	۱۰

$|x| = -1, -2$
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