

$$x(f(x)) \geq 0 \Rightarrow x \text{ نباید منفی باشد} \quad \left. \begin{array}{l} x > 0 \Rightarrow f(x) < 0 = (0, 2) \\ x < 0 \Rightarrow f(x) > 0 = (0, -3) \end{array} \right\} \Rightarrow [-5, 0] \cup [2, 4]$$

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$$f(x) \neq 0 \Rightarrow D_{f(x)} = \mathbb{R} - \{-3, 0, 2, 4\}$$

$$x > 0 \Rightarrow f(x) < 0 = (0, 2) \quad \left. \begin{array}{l} x < 0 \Rightarrow f(x) > 0 = (0, -3) \\ \frac{-2, -1, 1}{2} \leq (-3, 2) \end{array} \right\} \Rightarrow (-3, 0) \cup (0, 2) - \{0\}$$

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

$$f(-2) + 2f(2) = 12 \Rightarrow f(-2) = 1$$

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$$\text{if } x = (x-1) \quad f(x-1) = a(x-1)^2 - b(x-1) + 2$$

$$= ax^2 - 2ax + a - bx + b + 2$$

$$\Rightarrow f(x-1) - f(x) = 2ax + a + b$$

$$\Rightarrow -2ax + a + b = 4x + 1 \Rightarrow \begin{array}{l} a + b = 2 \Rightarrow b = 4 \\ a - b = -1 \end{array}$$

$$x = 4 \Rightarrow a = 3$$

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$$f(4) = 4 - \sqrt{4+2} = 4 - 3 = 1 \Rightarrow f(2) = 2(2) + 3 = 7$$

$$f(1) = 2(1) + 3 = 5 \Rightarrow f(4) = 4 - \sqrt{4+2} = 4 - 3 = 1$$

$$f(f(4)) - f(f(1)) = 7 + 2 = 9$$

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$$f(3) = 9 - 9 + 1 = 1$$

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

$$f(2) = 2 - 4 + 1 = -1 \Rightarrow f^2 = 1$$

$$\left. \begin{array}{l} f(3) = 1 \\ f(-1) = 2 \\ f(2) = -1 \end{array} \right\} \Rightarrow \frac{2+2}{1} = 4$$

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$$f(2) = 3(2) + 1 = 7$$

$$f(-2) = (-2)^2 = 4$$

$$f(2) = 3(2) + 1 = 7$$

$$\left. \begin{array}{l} f(2) = 7 \\ f(-2) = 4 \\ f(2) = 7 \end{array} \right\} \Rightarrow \frac{7-1}{4} = \frac{3}{4}$$

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$$f(2) = 1 \Rightarrow f(1) = 4$$

$$f(3) = 2 \Rightarrow f(2) = 4$$

$$f(1) = 4$$

$$\left. \begin{array}{l} f(2) = 1 \\ f(3) = 2 \\ f(1) = 4 \end{array} \right\} \Rightarrow \frac{4-4}{4} = 0$$

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$$x = \sqrt{3-2} \Rightarrow \frac{(\sqrt{3-2})^2 + 2(\sqrt{3-2}) + 9}{(\sqrt{3-2})^2 + 2(\sqrt{3-2}) + 4} = \frac{3+2 + 2\sqrt{3-2} - 1 + 9}{3+2 + 2\sqrt{3-2} - 1 + 4} = \frac{1}{2} = \frac{1}{2}$$

$$f(2) = \frac{2 + 1 + 9}{2 + 1 + 4} = \frac{12}{7}$$

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$$if(x) = \sqrt{x} \Rightarrow \sqrt{x} + \frac{1}{\sqrt{x}} = x + \frac{1}{x} = \left(x + \frac{1}{x}\right)^2 = x^2 + 2 + \frac{1}{x^2} - x^2 + \frac{1}{x^2}$$

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

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