

x و $f(x)$ هر دو هم علامت یا یکی از آنها صفر باشد $\sqrt{x f(x)} \rightarrow x f(x) \geq 0$

$D_f = [-5, 0] \cup [2, 5]$

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با x و $f(x)$ مختلف علامت باشد و خارج نباید صفر باشد $\frac{-x}{f(x)} \geq 0$ $f(x) \neq 0$

$D_f = (-3, 0) \cup (0, 2)$

D_f محدود $\begin{cases} -2 \\ -1 \\ 1 \end{cases}$

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$x=2 \rightarrow f(2) - 2f(2) = 4 - 4 + 4 = 4$

$f(2) = 2 \rightarrow f(2) = -2$

$x=-2 \rightarrow f(-2) - 2f(-2) = 4 + 4 + 4 = 12$

$f(-2) = 14 - 4 = 10$

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

$f(f(5)) = f(2) = 2 \times 2 + 3 = 7$

$f(1) = 2 \times 1 + 3 = 5$

$f(f(1)) = f(5) = 2$

$\underbrace{f(f(5))}_7 + \underbrace{f(f(1))}_2 = 9$

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$f(x-1) = a(x-1)^2 - b(x-1) + 2 = a(x^2 - 2x + 1) - b(x-1) + 2 = ax^2 - 2ax + a - bx + b + 2$

$f(x-1) - f(x) = ax^2 - 2ax + a - bx + b + 2 - ax^2 + bx - 1 = (-2a)x + (a+b)$

$(-2a)x + (a+b) = 2x + 2$

$-2a = 2 \rightarrow a = -1$

$a+b = 2 \rightarrow b = 3$

$a-b = -1-3 = -4$

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

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

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

$$\frac{1 \times 1 + 1}{(-1)^1} = \underline{\underline{-2}}$$

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$$f(9) = 3 \times 9 + 1 = 28$$

$$f(-1) = (-1)^3 = -1$$

$$f(1) = 3 \times 1 + 1 = 4$$

$$\frac{3 \times 28 - 1 \times (-1)}{4} = \frac{85}{4}$$

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$$\frac{f(f(9)) - f(f(1))}{f(1) - 1} = \frac{9 - 9}{1} = \underline{\underline{0}}$$

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

$$f(1) = \frac{1^2 + f \times 1 + 9}{1^2 + f \times 1 + 1} = \underline{\underline{\frac{11}{2}}}$$

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$$(f(\frac{1}{x}))^x = (x + \frac{1}{x})^x = x^x + 1 + \frac{1}{x^x}$$

$$(f(\frac{1}{x}))^x - f(x) =$$

$$x^x + 1 + \frac{1}{x^x} - x^x - \frac{1}{x^x} = \underline{\underline{1}}$$

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