

$$y = \sqrt{x f(x)} \geq 0 \rightarrow D = [-5, 0] \cup [2, 5] \cup \{0\}$$

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$$\sqrt{\frac{-x}{f(x)}} \geq 0 \rightarrow f(x) \neq 0$$

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$$D = (0, 2) \cup (0, -3) \rightarrow \{1, -1, -2\} \text{ عدد صحیح}$$

$$\begin{aligned} f(-2) &\rightarrow f(-2) - 2f(2) = \frac{14}{4+4} \\ f(2) &\rightarrow f(2) - 2f(2) = 2 \rightarrow f(2) = -2 \\ f(-2) + 2 &= 14 \rightarrow f(-2) = 12 \end{aligned}$$

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$$f(f(5)) + f(f(1)) = ?$$

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

$$f(2) = 2 - 2\sqrt{2}$$

$$f(1) = 1 + 2 = 3 \rightarrow f(3) = 2$$

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

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

$$f(x-1) - f(x) = ax^2 - 2ax + a - bx + b + 2 - (ax^2 - bx + 2) = -2ax + a + b = 9x + 2$$

$$a = -3 \quad -3 + b = 2$$

$$a - b = -3 - 5 = -8$$

$$b = 5$$

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$$f(x) = x^r - 1, x \neq -1 \quad \frac{r f(r) + f(-1)}{f'(r)}$$

$$f(r) = 1$$

$$f(-1) = 0$$

$$f'(r) = -1$$

$$\frac{r+0}{(-1)^r} = \frac{r}{1}$$

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$$\frac{r^2 f(r) - r f(-r)}{f'(r)}$$

$$\frac{(r \times 1^r) - (r \times r)}{r} = \frac{r^2 - r^2}{r} = \frac{0}{r} = 0$$

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$$f(r) = r^2$$

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

$$f'(r) = 2r$$

$$\frac{f(f'(r)) - f(f'(r))}{f'(r) - r} = \frac{f(-1)}{r}$$

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$$f(x) = \frac{x^r + r^2 x + 9}{x^r + r^2 x + 0}$$

$$f(\sqrt{r}-r) = \frac{r^2 + r^2 - r\sqrt{r} + r\sqrt{r} - 1 + 9}{r^2 + r^2 - r\sqrt{r} + r\sqrt{r} - 1 + 0} = \frac{8}{r^2} = \frac{8}{r^2}$$

$$f(f(\sqrt{r}-r)) = ?$$

$$f(r) = \frac{r^2 + 1 + 9}{r^2 + 1 + 0} = \frac{r^2 + 10}{r^2}$$

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

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

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