

$$\sqrt{x} f(x) = \dots \Rightarrow x f(x) \geq 0 \Rightarrow f(x) \geq 0 \Rightarrow [-\frac{1}{2}, 0] \cup [2, \infty)$$

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$$f(x) < 0 \Rightarrow (-\frac{1}{2}, 2)$$

✓

$$x < 0 \Rightarrow f(x) > 0 \Rightarrow (-\frac{1}{2}, 0) \Rightarrow \dots \Rightarrow [-\frac{1}{2}, 0] \cup [2, \infty)$$

$$f(x) < 0 \Rightarrow f(x) > 0 \Rightarrow \dots \Rightarrow 0, 0$$

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$$\sqrt{-2x} \quad \begin{array}{ccccccc} -4 & -3 & 0 & 2 & 5 \\ \hline \end{array}$$

حالت اول: $f(x) < 0, x > 0$

حالت دوم: $f(x) > 0, x < 0$

$$x = 0 \Rightarrow x_1 = -3, 0, 2, 5$$

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$$\frac{-2x}{f(x)} \geq 0 \Rightarrow D = (-3, 0) \cup (0, 2) \Rightarrow -2, -1, 1 \Rightarrow \dots$$

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$$f(x) - 2f(2) = x^2 - 3x + 4 \Rightarrow -f(2) = \frac{-4 + 4}{+2} = 0 \Rightarrow f(2) = 0$$

$$f(x) + 4 = \frac{-4 + 4}{-2} = 0 \Rightarrow f(-2) = 0$$

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$$f(f(5)) + f(f(1)) = 7 + 2 = 9$$

$$f(x) = \begin{cases} x - \sqrt{2x} & x < 2 \\ 2x + 3 & x \geq 2 \end{cases}$$

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

$$-2ax + a + b = 4x + 2 \Rightarrow -2a = 4 \Rightarrow a = -2 \Rightarrow a + b = 2 \Rightarrow b = 4$$

$$a - b = -2 - 4 = -6$$

✓

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$$f(x) = x^2 - 5x + 1$$

$$\frac{f(r) + f(-1)}{f(r)} \Rightarrow \frac{f(r) + 1}{f(r)} = 1 + \frac{1}{f(r)} \Rightarrow \sqrt{\quad}$$

$$\lim_{x \rightarrow 1} \frac{f(x) - f(1)}{x - 1} = \frac{f'(1)}{1} = f'(1)$$

① ✓

$$\frac{f(f'(x)) - f(f(x))}{f(x) - x} = \frac{4 - 4}{4 - 2} = 0$$

$$f = \{(2, 4), (3, 1), (4, 1), (1, 4)\}$$

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

$$f(f(\sqrt{r}-r)) = f(r) = \frac{(r+r)^r + \Delta}{(r+r)^r + 1} = \frac{r_1}{1v}$$

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

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