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$$f(x) = \{(x, 3)(2, 4)(1, 4)(3, 1)(5, 2)\}$$

$$f(x) = \{(1, 0)(4, 1)(-1, 5)(-2, 0-2)(3, 1)\}$$

الف) $f = g \Rightarrow \{(x, 2)(1, 4)(3, 2)\}$

ب) $\frac{f}{g} = 2f \Rightarrow \{(x, 2)(2, 4)(1, 1)(3, 2)(5, 2)\}$

$$\rightarrow \{(x, 2)(1, \frac{8}{5})(3, -2)\} \rightarrow \{(2, 4)(3, -2)\}$$

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$$f(x) = \{(x, 1)(3, 4)(-5, 2)(1, -1)\}$$

الف) $2f(x) = \{(x, 2)(3, 8)(-5, 4)(1, -2)\}$

ب) $f(x) + 1 = \{(x, 2)(2, 5)(-5, 3)(1, 1)\}$

ج) $3f^2(x) + 1 = 3f^2(x) = \{(x, 3)(3, 12)(-5, 12)(1, 12)\}$

$$\rightarrow \{(6, 4)(3, 16)(-5, 13)(1, 13)\}$$

د) $f(2x) = \{(x, 2)(2, 8)(-5, 4)(1, -2)\}$

-1

$$f(x) = \{(x, 0)(1, -4)(0, 2)(1, 1)\}$$

$$g(x) = \sqrt{9-x^2} \quad -3 < x < 3 \quad \{(2, \sqrt{5})(1, \sqrt{2})(0, 3)\}$$

الف) $\frac{f}{g} = \{(2, 0)(1, -\sqrt{2})(0, \frac{3}{\sqrt{2}})\}$

ب) $\frac{f}{g} = \{(2, \sqrt{5})(1, -\sqrt{2})(0, \frac{3}{\sqrt{2}})\} \rightarrow \{(1, -\frac{1}{\sqrt{2}})(0, \frac{3}{\sqrt{2}})\}$

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

$$\frac{x-1}{x} = -3 \xrightarrow{\text{ضرب در } x} \frac{x^2+1}{x^2} - 2 = +9$$

$$f(-3) = 11$$

$$= \left(\frac{x^2+1}{x^2} = 11 \right)$$

$$\frac{x^2+1}{x^2} = 11$$

TOPCO

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

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

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

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

$$f(x-1) - f(x) = 4x + 7$$

$$a(x-1)^2 + b(x-1) + c - (ax^2 + bx + c) = 4x + 7$$

$$f(x-1) - f(x) = 4x + 7 \Rightarrow a(x^2 - 2x + 1) + b(x-1) + c - ax^2 - bx - c = 4x + 7$$

$$a + b - 2ax - b = 4x + 7$$

$$a + b = 7$$

$$-2a = 4 \Rightarrow a = -2$$

$$-b = 7 \Rightarrow b = -7$$

$$a = -2$$

$$-2 + b = 7 \Rightarrow b = 9$$

$$c = -1$$

$$f(x) = \begin{cases} x - \sqrt{x} + 1 & x > 1 \\ 2x + 1 & x \leq 1 \end{cases}$$

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

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

$$f(-1)$$

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

$$f(x) = 1 \Rightarrow f(x) = -1$$

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

$$f(-1) = 1$$

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$$y = \sqrt{\frac{-x}{f(x)}} \quad \frac{-x}{f(x)} \geq 0 \quad -2$$

محدوده تعریف تابع
میشود

$$x \in [-3, 0] \cup [2, 5]$$

-3	0	2	5
	+	+	-
+	+	+	-

$$y = \sqrt{x f(x)} \quad x f(x) \geq 0 \quad D_f = [-5, 0] \cup [2, 5] \quad -1$$

-5	0	2	5
+	+	-	+