

$$x \times f(x) \geq 0$$

	-5	-2	0	2	5
$f(x)$	+	-	-	+	+
x	-	-	+	+	+
	-	+	-	-	+

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

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

	-4	-3	0	2	5
$f(x)$	-	+	-	+	+
$-x$	+	+	-	-	-
	-	+	+	+	-

$$\rightarrow D_f = (-3, 2) - \{0\} \cup \{-4\}$$

دارای صیغ: $-4, 2, 1, -1, -2, -3$

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

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

$$f(-2) = (-2)^2 - 3(-2) \Rightarrow 4 + 6 = 10$$

$$f(1) = 1 \times 1 + 3 = 5 \rightarrow f(5) = 5 - \sqrt{1+5} = 5 - 3 = 2$$

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

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

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

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

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

$$\rightarrow -2ax + a + b = 4x + 4 \rightarrow \begin{cases} -2a = 4 \rightarrow a = -2 \\ a + b = 4 \rightarrow -2 + b = 4 \rightarrow b = 6 \end{cases} \Rightarrow a - b = -2 - 6 = -8$$

$$f(x) = \frac{x^4 + 4x + 5}{x^4 + 4x + 5} = \frac{(\sqrt{5}-1)^4 + 4(\sqrt{5}-1) + 5}{(\sqrt{5}-1)^4 + 4(\sqrt{5}-1) + 5} = \frac{5 + 4 - 4\sqrt{5} + 4\sqrt{5} - 4 + 5}{5 + 4 - 4\sqrt{5} + 4\sqrt{5} - 4 + 5} = \frac{5 - 4 + 5}{5 - 4 + 5} = \frac{6}{6} = 1$$

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$$f(x) = \frac{(x+1)^4 + 1}{(x+1)^4 + 1} = \frac{(\sqrt{5}-1+1)^4 + 1}{(\sqrt{5}-1+1)^4 + 1} = \frac{1+1}{1+1} = \frac{2}{2} = 1$$

$$x - \frac{1}{x} = -3$$

$$f(x - \frac{1}{x}) = \frac{x^4 + 1}{x^4} = \frac{x^4}{x^4} + \frac{1}{x^4} = x^4 + \frac{1}{x^4} \rightarrow f(-3) = (-3)^4 - 2 = 81 - 2 = 79$$

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

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$$g(x) = \sqrt{9 - x^2} \rightarrow 9 - x^2 \geq 0 \rightarrow 3 \geq x^2 \rightarrow 3 \geq x \geq -3 \rightarrow D_f = [-3, 3]$$

$$f(x) = \{(2, 0), (1, -3), (0, 2), (3, 1)\} \rightarrow D_f = \{2, 1, 0, 3\}$$

$$D_f = \{x, 1, 0\} \rightarrow$$

$$D_f = \{2, 1, 0\}$$

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

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

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

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

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

$$c) 3f(x) + 1 = \{(2, 7), (3, 4), (-5, 13), (1, 13)\}$$

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

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

$$g(x) \rightarrow D_g = \{1, 2, -1, -2, 3\}$$

$$D_f \cap D_g = \{1, 2, 3\}$$

$$D_f = \{2, 3, 1\}$$

$$b) \frac{f}{g} = \{(1, \frac{3}{-1}), (2, \frac{3 \times 2}{-2}), (3, \frac{5 \times 1}{-1})\}$$

$$c) = \{(2, 4), (3, -2)\}$$

$$a) f - g = \{(1, (3-0)), (2, (3-1)), (3, (5-(-1)))\}$$

$$d) = \{(1, 3), (2, 2), (3, 6)\}$$

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