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$$x^2 f(x+1) > 0$$

$$f(x+1) > 0$$

$$\frac{1}{x} - 1 > 0$$

$$\frac{1}{x} > 1$$

$$x-1 \leq 0$$

$$x \leq 1$$

$$x^2 > 0$$

$$x > 0$$

$$\frac{x}{y} \left| \begin{array}{ccc} 0 & 1 & \\ - & 0 & + & 0 & - \end{array} \right.$$

$$D = [0, 1]$$

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$$f(x) = \sqrt{-x+|2-x|}$$

$$-x+|2-x| \geq 0$$

$$|2-x| \geq x$$

$$\begin{array}{l} x \geq 2 \rightarrow x-2 \geq x \quad -2 \geq 0 \quad \text{غلط} \\ x < 2 \rightarrow 2-x \geq x \quad 2 \geq 2x \quad \sqrt{2} \leq x < \sqrt{2} \end{array}$$

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$$D = [2, +\infty) \cap [-\sqrt{2}, \sqrt{2}] = [-\sqrt{2}, \sqrt{2}]$$

$$D_f = (-\infty, 1]$$

$$D_f = [-\infty, 2]$$

x	-4	1	2	3
$x-1$	$-$	0	$+$	$+$
$f(x) + 0$	$-$	$-$	$+$	$+$
g	$-$	$+$	0	$-$

$$D = (-4, 1] \cup (2, 3)$$

$$4x^2 - 7x^2 - f(x-3) = (3x^2 - x - 3)(3x^2 + x + 1) = 0$$

$$3x^2 - x - 3 = 3x^2 + ax + b$$

$$a = -1$$

$$b = -3$$

$$\sqrt{-(a+b)} = \sqrt{-(-1-3)} = \sqrt{4} = 2$$

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$$f(x) - f\left(\frac{1}{x}\right) > 0$$

$$\frac{x^2 + x^2 - f(x^2 - 1)}{x^2} > 0$$

x	-2	0	2
y	$-$	0	$+$

$$D = [-2, 0) \cup [2, +\infty)$$

$$\frac{x^2 + x^2 - f(x^2 - 1)}{x^2} > 0$$

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

$$x = \pm 2$$

$$x^2 = 0$$

$$x = 0$$

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$$f_{(1^2+1)} + f_{(1^2+2)} = 1(1)^2 - 1 + 1(1)^2 - 1 = 10 - 2 = 8$$

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$$g(\sqrt{v}-3) = (\sqrt{v}-3)^3 + 9(\sqrt{v}-3)^2 + 12(\sqrt{v}-3) = v - 2\sqrt{v} - 9\sqrt{v} + 9 + 12\sqrt{v} - 36 + 12\sqrt{v} - 36 = -20$$

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$$f(\sqrt{v}+2) = (\sqrt{v}+2)^3 - 6(\sqrt{v}+2)^2 + 12(\sqrt{v}+2) = \dots = 10$$

$$\frac{g(\sqrt{v}-3)}{f(\sqrt{v}+2)} = \frac{-20}{10} = -2$$

$$(f(x) + g(x))^2 = x^2 - 4x + 4 + x^2 + 4x + 4 + 2\sqrt{x^2 - 4x + 4} = 2x^2 + 2\sqrt{(x-2)^2}$$

$$2x + 2|x-2| \begin{cases} x \geq 2 \rightarrow 2x + 2x - 4 = 4x - 4 \Rightarrow f(x) + g(x) = \sqrt{4(x-2)} = 2\sqrt{x-2} \quad \text{ق ق} \\ x < 2 \rightarrow 2x - 2x + 4 = 4 \Rightarrow f(x) + g(x) = \sqrt{4} = 2 \quad \text{غ ق ق} \end{cases}$$

با صورت سوال مطابقت ندارد و جواب ثابت می دهد.

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$$\begin{aligned} a &= 0 \\ b &= 2 \\ c &= -4 \end{aligned}$$

$$\frac{a+b}{c} = \frac{0+2}{-4} = -\frac{1}{2}$$

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$$\begin{aligned} x^2 - 4x + 3 &\neq 0 \\ (x-3)(x-1) &\neq 0 \\ x &\neq 1, 3 \end{aligned} \quad \frac{g(x)}{f(x)} = \frac{1}{-4} \quad \frac{g(0)}{f(0)} = \frac{\frac{1}{4}}{\frac{1}{3}} = \frac{3}{4}$$

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$$\frac{g(x)}{f(x)} = \left\{ -\frac{1}{4}, \frac{3}{4} \right\}$$

$$\frac{g}{f} = \left\{ \left(2, \frac{1}{4} \right), \left(0, \frac{3}{4} \right) \right\}$$

$$\text{الف) } f(2x) = \left\{ \left(\frac{1}{2}, 2 \right), \left(-\frac{1}{2}, -1 \right), (1, 2), (3, 6) \right\} = \left\{ \left(\frac{1}{2}, 2 \right), \left(\frac{3}{2}, -1 \right), (2, 2), \left(\frac{1}{2}, 6 \right) \right\}$$

$$\text{ب) } f(x^2) = \left\{ (\sqrt{2}, 2), (-\sqrt{2}, 2), (\sqrt{6}, 6), (-\sqrt{6}, 6) \right\}$$

$$\text{ج) } 2g^2(x) + 1 = \left\{ (-2, 9), (1, 3), (\sqrt{2}, 9), (-1, 1) \right\}$$

$$\text{د) } \frac{2f}{g} = \left\{ \left(-\frac{1}{2}, \frac{10}{3} \right), (3, -1), (1, -4) \right\}$$

ب) 10

$$\begin{aligned} x^2 &= 1 \rightarrow x = \pm 1 \\ x^2 &= 3 \rightarrow x = \pm \sqrt{3} \\ x^2 &= 6 \rightarrow x = \pm \sqrt{6} \\ x^2 &= 1 \rightarrow x \end{aligned}$$

$$\rightarrow \left\{ (\pm 1, 2), (\pm \sqrt{3}, -1), (\pm \sqrt{6}, 6) \right\}$$

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