

$$y = \sqrt{x^3 f(x+1)} \rightarrow x^3 \times (x^4 - 1) \geq 0 \quad \frac{0}{-} \quad \frac{1}{+} \quad \frac{-}{-}$$

$$D_f: [0, 1]$$

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$$f(-x) = \sqrt{|x-x|-x} \Rightarrow |x-x|-x \geq 0 \quad \frac{2}{2-2x} \quad \frac{1}{-}$$

$$2-2x \geq 0 \Rightarrow 2x \leq 2 \Rightarrow x \leq 1$$

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

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$$y = \sqrt{\frac{x-1}{f(x)}}$$

$$\frac{1}{-} \quad \frac{1}{+} \quad (I)$$

$$\frac{-1}{+} \quad \frac{2}{-} \quad \frac{3}{+} \quad \frac{-}{-} \quad (II)$$

$$\Rightarrow \frac{-1}{-} \quad \frac{1}{+} \quad \frac{2}{-} \quad \frac{3}{+} \rightarrow D_f = (-1, 1] \cup (2, 3)$$

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$$(3x^2 - x - 3)(3x^2 + x + 1)$$

$$\rightarrow \Delta < 0$$

$$\Rightarrow 3x^2 - x - 3 \leq 3x^2 + x + 1 \Rightarrow b = -3, a = -1$$

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

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$$y = \sqrt{f(x) - f\left(\frac{1}{x}\right)}$$

$$\frac{-1}{-} \quad \frac{0}{+} \quad \frac{2}{-}$$

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

$$D_f = [2, 0) \cup [2, +\infty)$$

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

$$f(1+2) = f(3) = 3-1 = 2$$

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

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

$$g(x) = (x+3)^2 - 2V$$

$$\Rightarrow \frac{g(\sqrt{V-2})}{f(\sqrt{V-2})} = \frac{V-2V}{2+1} = \frac{-V}{3} = \boxed{-\frac{V}{3}}$$

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

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

$$f(x) + g(x) = 2\sqrt{x-4} \Rightarrow a=0, b=2, c=-4$$

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

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$$f(x) = \frac{(x+2)}{(x-1)(x-3)} \Rightarrow D_{\frac{g}{f}} = \{2, 0\}$$

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

$$f(x) = \left\{ \left(\frac{1}{f}, 2\right), \left(\frac{f}{g}, -1\right), (2, 2), \left(-\frac{1}{f}, 2\right) \right\}$$

$$b) f(x^2) = \left\{ (1, 2), (-1, 2), (2, -1), (-2, -1), (2, 2), (-2, 2) \right\}$$

$$c) 2y^2(x) + 1 = \left\{ (-2, 1), (1, 3), (3, 9), (-1, 1) \right\}$$

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

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