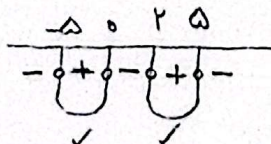


$$y = \sqrt{x f(x)} \rightarrow x=0 \rightarrow \boxed{x=2, 5, -5}$$

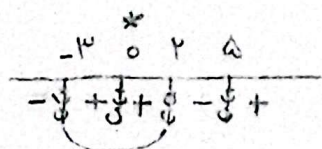
$$\Rightarrow D_f = [-5, 0] \cup [2, 5]$$



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$$y = \sqrt{\frac{-x}{f(x)}} \rightarrow x=0 \rightarrow x=2, 5, 0, -3$$

$$\Rightarrow D_f = (-3, 0) \cup (0, 2) \cup (5, +\infty)$$



تامل بر شمار عدد صفر

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

$$f(-2) = f(-2) + 4 = 4 + 4 + 4 \rightarrow \boxed{f(-2) = 10}$$

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$$f(x) = \begin{cases} x - \sqrt{x+4} & ; x > 3 \\ 2x+3 & ; x \leq 3 \end{cases} \quad \begin{aligned} f(5) &\rightarrow 5 - \sqrt{9} \rightarrow (2) \\ f(2) &\rightarrow 2+3 = (5) \end{aligned}$$

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$$f(f(5)) + f(f(1)) = 5 + 4 = \boxed{9}$$

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

$$\begin{aligned} f(x-1) - f(x) &= 4x+2 \\ \downarrow \\ a(x-1)^2 - b(x-1) - f(x) &= 4x+2 \\ a(x^2 - 2x + 1) - b(x-1) - (ax^2 - bx + 1) &= 4x+2 \\ ax^2 - 2ax + a - bx + b - ax^2 + bx - 1 &= 4x+2 \\ -2ax + a + b &= 4x+2 \quad x=1 \rightarrow -2a + a + b = 6 \\ \rightarrow -a + b &= 6 \rightarrow \boxed{a-b = -6} \end{aligned}$$

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$$f(x) = \frac{x^2 + 4x + 5}{x^2 + 4x + 5} \xrightarrow{\text{جایگزینی}} \frac{(\sqrt{3}-2)^2 + 4(\sqrt{3}-2) + 5}{(\sqrt{3}-2)^2 + 4(\sqrt{3}-2) + 5} = \frac{\cancel{\sqrt{3}}^2 - 4\sqrt{3} + 4 + 4\sqrt{3} - 8 + 4 + 5}{\cancel{\sqrt{3}}^2 - 4\sqrt{3} + 4 + 4\sqrt{3} - 8 + 4 + 5} = \frac{4}{4} = 1$$

$$f(\sqrt{3}-2) = \boxed{\frac{4}{4} = 1}$$

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$$f\left(x - \frac{1}{x}\right) = \frac{x^2 + 1}{x^2} \rightarrow x^2 + \frac{1}{x^2} = f\left(x - \frac{1}{x}\right) \xrightarrow{?} \left(x - \frac{1}{x}\right)^2 = x^2 + \frac{1}{x^2} - 2 \quad (+2)$$

$$f(-3) = (-3)^2 - 2 = 9 - 2 = \boxed{7}$$

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

$$g(x) = \sqrt{9 - x^2}, \quad 9 > x^2$$

$$x < 3, x > -3$$

$$\boxed{-3 \leq x \leq 3} = D$$

$$\text{الف) } \frac{f}{g} \left\{ (2, 0), \left(1, \frac{-4}{-4}\right), \left(0, \frac{2}{2}\right) \right\}$$

$$-\frac{x\sqrt{2}}{x} = \frac{-x}{\sqrt{2}} = \frac{-x\sqrt{2}}{2}$$

$$\frac{-x\sqrt{2}}{2} = -\frac{\sqrt{2}}{2}x$$

$$\text{ب) } \frac{g}{f} \left\{ \left(\cancel{2}, \frac{\sqrt{5}}{\cancel{0}}\right), \left(1, \frac{\sqrt{1}}{-4}\right), \left(0, \frac{3}{2}\right) \right\}$$

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

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

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

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$$\text{ب) } f(x) + 1 = \{(2, 2), (3, 5), (-5, 3), (1, -1)\} \quad \text{د) } f(2x) = \{(1, 1), \left(\frac{3}{2}, 4\right), \left(\frac{-5}{2}, 2\right), \left(\frac{1}{2}, -2\right)\}$$

$$\text{الف) } f - g = \{(2, 2), (1, 4), (3, 2)\}$$

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

$$\text{ب) } \frac{f}{g} \rightarrow \{(2, 4), (\cancel{1}, \cancel{4}), (3, -2)\}$$

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