

$$f(x) = \left(\frac{1}{x}\right)^{n-1} = \left(\frac{1}{x}\right)^n \left(\frac{1}{x}\right)^{-1} = x \left(\frac{1}{x}\right)^n = x^{-n+1}$$

$$y = \sqrt{x^n f(x+1)} \quad x^n f(x+1) \geq 0 \quad \begin{matrix} x \geq 0 \\ n \geq 0 \end{matrix} \quad f(x+1) \geq 0$$

همواره یقیناً

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

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

قدر مطلق است

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

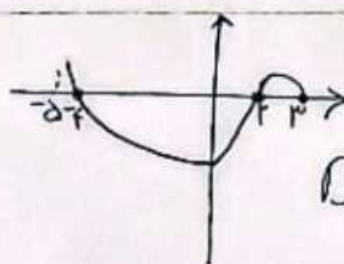
$$|x-2| \geq x$$

$$x-2 \leq -x \quad \text{or} \quad x-2 \geq x$$

$$x \leq 2 \quad \text{or} \quad x \leq -2$$

$$x \leq 2$$

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



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

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

$$y_1 = \frac{1}{ax^2 - bx - c} \quad y_2 = \frac{1}{cx^2 + ax + b} \quad D_{y_1} = D_{y_2} = \mathbb{R} - \{x \mid \text{denominator} = 0\}$$

$$ax^2 - bx - c = 0 \quad cx^2 + ax + b = 0$$

$$a+c=0, a=-c \quad ad+bc=-c \quad \text{if } c \neq 0 \quad \frac{a}{c} = -1 \quad \frac{b}{c} = -1 \quad \frac{d}{c} = -1$$

$$-c^2 + cb + cd = -c \quad a(d-b) = -c \quad \frac{a}{c} = -1 \quad \frac{b}{c} = -1 \quad \frac{d}{c} = -1$$

$$-(a+b) = -(-c) \quad -(a+b) = c$$

$$f(x) = x^2 + x \quad y = \sqrt{f(x) - f\left(\frac{1}{x}\right)}$$

$$y = \sqrt{x^2 + x - \left(\frac{1}{x^2} + \frac{1}{x}\right)} = \sqrt{\frac{1}{x^2}(x^4 - 1) + \frac{1}{x^2}(x^4 - 4x)} =$$

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

$$\sqrt{\frac{1}{x^2}(x^4 - 1)(1 + \frac{1}{x^2}(x^4 + 4x))} \quad \begin{matrix} -1 & 0 & 1 \\ -1 & +1 & -1 \end{matrix} \quad D = [-1, 0) \cup [1, +\infty)$$

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

$$f(1) \xrightarrow{\text{if } x=1} f(1^2 + 2) = 2(1)^2 - 1 = 1$$

$$f(0) \xrightarrow{\text{if } x=0} f(0^2 + 2) = 2(0)^2 - 1 = -1$$

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

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$$f(x) = x^2 - 4x + 11 \Rightarrow f(x-1) = (x-1)^2 + 10 \quad g(x) = x^2 + 4x + 11 \Rightarrow g(x+1) = (x+1)^2 + 10$$

$$\frac{g(\sqrt{10}-1)}{f(\sqrt{10}+1)} = \frac{g(\sqrt{10})^2 - 10}{f(\sqrt{10})^2 + 10} = \frac{-10}{10} = -1$$

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

$$g(x) = \sqrt{x-1} \sqrt{x+1} - 1 + 1 = \sqrt{(x-1)(x+1)}$$

$$f(x) + g(x) = |\sqrt{x-1} + 1| + |\sqrt{x-1} - 1| = \sqrt{x-1} + 1 + \sqrt{x-1} - 1 = 2\sqrt{x-1}$$

لا از اینجاست جواب $a+b\sqrt{c}$ $a+b = \frac{0+1}{-1} = -1$

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$$f(x) = \frac{x+1}{x^2-4x+3} \quad x^2-4x+3 \neq 0 \quad (x-1)(x-3) \neq 0 \quad g(x) = \left\{ \left(\frac{1}{2} \right), (1, 0), \left(\frac{3}{2}, 0 \right), (2, 1) \right\}$$

$$Df = \mathbb{R} - \{1, 3\}$$

$$f(0) = \frac{1}{3} \quad f(1) = \frac{1}{1-4+3} = -1$$

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

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

$$\text{الف) } f(g(x)) = \left\{ \left(\frac{1}{2}, 2 \right), \left(\frac{3}{2}, -1 \right), \left(\frac{1}{2}, 2 \right), \left(\frac{3}{2}, 4 \right) \right\} \rightarrow \text{مولفه اول}$$

$$\text{ب) } f(g(x)) = \left\{ (\sqrt{1}, 2), (\sqrt{3}, -1), (2, 2), (\sqrt{1}, 2) \right\} \rightarrow \text{جزء مولفه اول}$$

$$\text{ج) } f(g(x)) + 1 = \left\{ (-1, 3), (1, 3), (3, 4), (-1, 1) \right\} \rightarrow \text{مولفه دوم به قدر 1 اضافه شود}$$

$$\text{د) } \frac{f}{g} = \left\{ \left(-\frac{1}{2}, \frac{1}{2} \right), \left(1, -\frac{1}{2} \right), \left(3, -\frac{1}{2} \right) \right\} = \left\{ (1, -1), (3, -1) \right\} \rightarrow \text{مولفه اول مشترک}$$

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