

$$x^x + (x+1) \geq 0 \quad \left(\frac{1}{x}\right)^{x-1} - 1 = 0$$



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

$$x=1$$

$$D_f = [0, 1]$$

$$x + |x+1| \geq 0$$

$$|x+1| \geq -x$$

$$D_{f(-x)} = [1, +\infty)$$

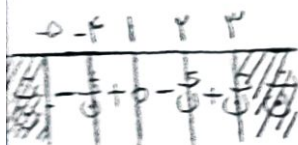
$$x+1 \geq -x \quad x \geq 1$$

$$x+1 \leq x$$

$$1 \leq 0 \quad \times$$

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

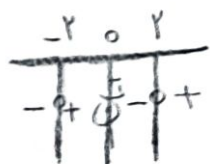
$$D_f = (-1, 1] \cup (2, \infty)$$



$$y = \sqrt{x^x + x - \frac{4x}{x^2} - \frac{x}{x}} = \sqrt{\left(x - \frac{x}{x}\right)\left(x^x + \frac{17}{x^2} + x\right) + 1 - \frac{x}{x}} = \sqrt{\left(x - \frac{x}{x}\right)\left(x^x + \frac{17}{x^2} + x\right)}$$

$$x - \frac{x}{x} \geq 0$$

$$\frac{x^x - x}{x} \geq 0$$



$$D_f = [-1, 0) \cup [1, +\infty)$$

$$x^x + x = 1$$

$$x^x + x = 10$$

$$f(2) + f(10) = 2 - 1 + 10 - 1 = 10$$

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

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

$$\frac{g(\sqrt{2} - 2)}{f(\sqrt{2} + 2)} = \frac{(\sqrt{2} - 2 + 2)^2 - 2\sqrt{2}}{(\sqrt{2} + 2 - 2)^2 + 1} = \frac{-2\sqrt{2}}{10} = -\frac{2}{5}$$

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

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

$$x \geq 1 \Rightarrow g(x) + f(x) = \sqrt{x-1} - 2 + \sqrt{x-1} + 2 = 2\sqrt{x-1} + 0 \quad a=0 \quad b=1 \quad c=-1 \quad \frac{a+b}{c} = \frac{1}{-1} = -1$$

$$x \geq 4 \Rightarrow g(x) + f(x) = 2 - \sqrt{x-1} + \sqrt{x-1} + 2 = 4 \quad a=1 \quad b=0 \quad c \in \mathbb{R}$$

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

$$g(2) = 1$$

$$f(2) = \frac{f}{f-f+c} = \frac{f}{c}$$

$$\frac{g(2)}{f(2)} = \frac{c}{f}$$

$$f(1) = \frac{c}{1-f+c} \Rightarrow \text{تعريف نشود}$$

$$f(c) = \frac{c}{c-1+f+c} \Rightarrow \text{تعريف نشود}$$

$$f(0) = \frac{f}{c} \quad \frac{g(0)}{f(0)} = \frac{f}{\frac{f}{c}} = c$$

$$g(0) = f$$

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

$$\text{ب) } f(x^2) = \left\{ (1, 2), (\sqrt{c}, -1), (2, 2) \right\}$$

$$\text{ج) } 2g^2(x) + 1 = \left\{ (-2, 19), (1, 3), (3, 9), (-1, 1) \right\}$$

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