

$$f(10-x) \geq f(x+1)$$

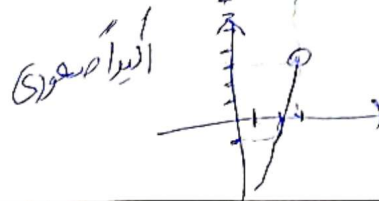
$$10-x \geq x+1$$

$$9 \geq 2x$$

$$4.5 \geq x$$

$$D_f = (-\infty, 4.5]$$

$$f(x) = \begin{cases} 3x-1 & x \geq 10 \\ 10-x & x < 10 \end{cases}$$



$$f(x) = (x^3 + x)^{10}$$

$$f \circ f(x) < f(x)^2$$

$$f(x) < x^{10}$$

$$(x^3 + x)^{10} < x^{20}$$

$$x^3 + x < x^2$$

$$x^3 < 0 \quad x < 0$$

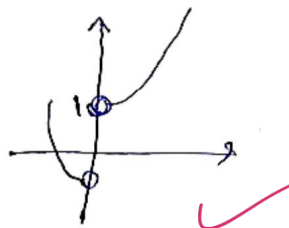
$$x \in (-\infty, 0)$$

$$g = |x| \left( x^2 + \frac{1}{x} \right)$$

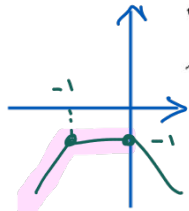
$$x^3 + 1 \quad x > 0$$

$$-x^3 - 1 \quad x < 0$$

غیر صاف



$$f(x) = \frac{2x+1}{|x|-|x+1|} \times \frac{|x|+|x+1|}{|x|+|x+1|} = -|x|-|x+1|$$



$$x^2 - x^2 - 2x - 1$$

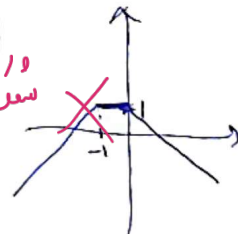
$$(-\infty, 1]$$

$$(-\infty, -1] \text{ صعودی است}$$

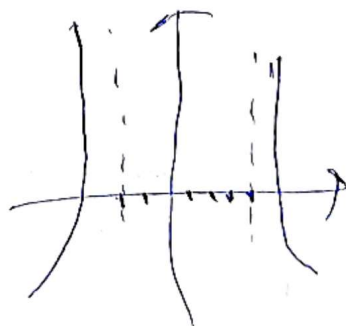
$$[1, \infty) \text{ ثابت}$$

$$a=1$$

$$(-\infty, 0] \text{ صعودی} \rightarrow a=0$$



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



$$(-\infty, -2)$$

البراصغر

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$$(a^2 - 1)^x$$

$$a) \quad a^2 - 1 > 1 \Rightarrow a^2 - \varepsilon > 0$$

$$a \in (-\infty, -1) \cup (1, +\infty)$$

$$b) \quad a^2 - 1 = 1 \Rightarrow a^2 = 2 \Rightarrow a = \pm \sqrt{2}$$

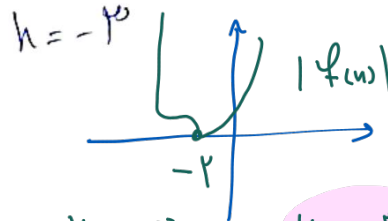
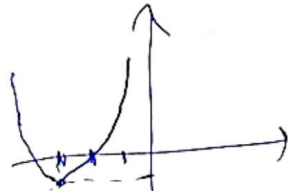
$$a^2 - 1 = 1 \Rightarrow a = \pm \sqrt{2}$$

$$a \in (-\infty, -1] \cup \{-\sqrt{2}\} \cup \{\sqrt{2}\} \cup [1, +\infty)$$

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

$$(1+\infty) = (-1, +\infty)$$

$$y = |f(x)|$$



$$f(x) \geq 0 \rightarrow (x+1)^2 - 1 \geq 0 \rightarrow x+1 \geq 1 \rightarrow x \geq 0 \rightarrow x \in [0, +\infty)$$

$$f(x) \leq f(\sqrt{x})$$

$$f(x) = x + \sqrt{x} - 1 \quad D_{f \circ f} \rightarrow f(x) \in D_f$$

$$f(x) \leq \sqrt{x}$$

$$x + \sqrt{x} - 1 \leq \sqrt{x}$$

$$x \leq 1$$

$$\sqrt{x} \geq 0 \Rightarrow x \geq 0$$

$$x \in [0, 1]$$

$$x \in [0, 1] \Rightarrow x \in [0, 1]$$

$$x + \sqrt{x} - 1 \geq 0 \rightarrow (\sqrt{x} + 1)(\sqrt{x} - 1) \geq 0$$

$$x \geq 1 \rightarrow D_{f \circ f} \subset [1, +\infty)$$

$$\sqrt[3]{9 \cos^2 x - 1} - 1 \leq \sqrt[3]{1 - 9 \cos^2 x}$$

$$9 \cos^2 x \leq 1 \Rightarrow 0 \leq 9 \cos^2 x \leq 1$$

$$\Rightarrow -1 \leq \cos x \leq 1$$

$$\Rightarrow -1 \leq \sqrt{9 \cos^2 x - 1} \leq 1$$

$$\Rightarrow \frac{1}{9} \leq \sqrt[3]{9 \cos^2 x - 1} \leq 1$$

$$t - \frac{1}{t} = \frac{t^2 - 1}{t}$$

$$\frac{18}{2} + \frac{10}{2}$$

$$= \frac{28}{2}$$

$$\frac{1}{2} - 1 = -\frac{1}{2}$$

$$\frac{1}{2} - 1 = -\frac{1}{2}$$

$$[-\frac{10}{2}, \frac{18}{2}]$$

$$f(x) = x - [x] - 1$$

$$R_f = [-1, 1)$$

$$R_{g \circ f} = ?$$

$$g = \frac{1^x - 1}{x}$$

$$1^x = 1$$

$$g \circ f = \frac{1^x - 1}{x}$$

$$R_{g \circ f} = [-\frac{18}{2}, -\frac{10}{2}]$$

$$[-1, 1) = [-\frac{1}{2}, \frac{1}{2})$$

$$\frac{1}{2} - 1 = -\frac{1}{2}$$

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