

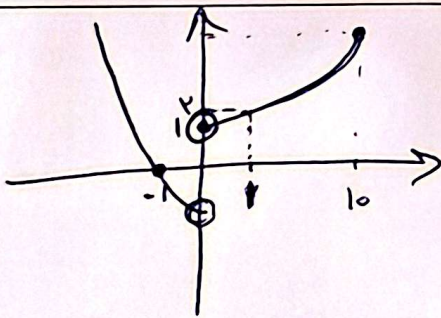
$$(x+2)=+ \rightarrow f(+)= \begin{cases} 3(+2)+1: + \geq 3 \\ 4(+2)+1: + < 3 \end{cases} \quad x \leq \frac{1}{2} \quad \begin{matrix} (-\infty, 0] \cup (0, 2) \cup [2, +\infty) \\ x \leq \frac{1}{2} \end{matrix}$$

$$f(2-x) - f(x+1) \geq 0 \rightarrow \begin{cases} 3-x \geq 3 \rightarrow x \leq 0 \rightarrow \begin{cases} 1-3x: x \leq 0 \\ 3-4x: x > 0 \end{cases} \\ x+1 \geq 3 \rightarrow x \geq 2 \rightarrow \begin{cases} 4x-1: x < 2 \\ 3x+2: x \geq 2 \end{cases} \end{cases}$$

$$D_f = (-\infty, 1] \quad \checkmark$$

$$f(f(x)) < f(x^3) \rightarrow f(x) < x^3$$

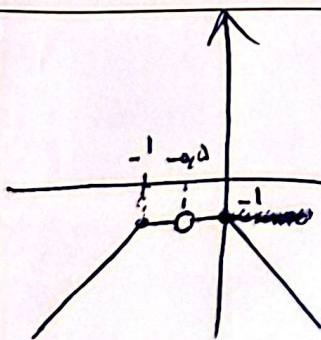
$$(x^3+x)^3 < x^3 \rightarrow x^3+x < x \rightarrow x^3 < 0 \rightarrow \boxed{x < 0} \quad \checkmark$$



$$x \geq 0 \rightarrow x^3+1 \rightarrow \text{اکیده صعودی}$$

$$x \leq 0 \rightarrow -x^3-1 \rightarrow \text{اکیده انزولی}$$

تابع یک توانیم



$$x = 0 \text{ و } x < -1 \rightarrow \text{اکیده صعودی}$$

$$-1 \leq x \leq 0 \rightarrow \text{صعودی}$$

$$0 < x \rightarrow \text{اکیده انزولی}$$

$$D = (-\infty, 0] \rightarrow \boxed{a=0} \quad \checkmark$$

$$x^2-2x-1 > 0 \rightarrow (x-4)(x+2) > 0 \rightarrow x < -2 \text{ یا } x > 4$$

برای صعودی بودن گنا بیستم باید عبارت کاهشش باشد. $\rightarrow$ گنا بیستم کاهشش است $\rightarrow$ باید گنا بیستم کوچکتر از 1 است

$$\boxed{(-\infty, -2)} \quad \checkmark$$

$$a^2 - 3 > 0 \rightarrow |a| > \sqrt{3}$$

(1, 5)

$$\left. \begin{array}{l} (a^2 - 3) > 1 \rightarrow \text{صعودی} \\ 0 < (a^2 - 3) < 1 \rightarrow \text{نزولی} \end{array} \right\} (a^2 - 3) > 1 \rightarrow |a| > 2 \checkmark$$

$$(a^2 - 3) \geq 1 \rightarrow |a| \geq 2 \rightarrow (-\infty, -2] \cup [2, +\infty) \checkmark$$

$a^2 - 3 = 0 \rightarrow a = \pm\sqrt{3}$ صعودی $\cup \{\pm\sqrt{3}\}$

$$-2r + 9a - 3b + c = -1$$

$$f'(-3) = 0 \rightarrow 2r - 6a + b = 0 \quad (1)$$

$$2r - 6a + \frac{a^2}{r} = 0 \rightarrow a = 9, b = 2r$$

$c = 2$

$$f(x) = x^3 + 9x^2 + 2rx + 25 \Rightarrow 0 \rightarrow \text{کسب مقدار} = -2 \rightarrow k = -2 \checkmark$$

$$f(f(x)) \leq f(5x) \rightarrow f(x) \leq 5x \rightarrow x + 5x - 2 \leq 5x$$

$$\rightarrow x - 2 \leq 0 \rightarrow x \leq 2$$

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

$f \circ f(x) \rightarrow f(x) \geq 0 \rightarrow x \geq 1$

$[1, 2]$

$[0, 2]$

$\rightarrow$ صریح

$$-1 \leq \cos x \leq +1 \rightarrow 0 \leq \cos^2 x \leq 1$$

$$\left\{ \begin{array}{l} \sqrt{x} - \sqrt{-x} = x^2 - (-x)^2 = \frac{10}{x} = b \\ \sqrt{-1} - \sqrt{1} = (-1)^2 - 1^2 = -\frac{3}{x} = a \end{array} \right\} b - a = \frac{10}{x} + \frac{3}{x} = \frac{13}{x}$$

$$R_f = [-2, 3) \rightarrow D_g = [2, 3) \rightarrow R_g = \left[\frac{x^2 - (-x)^2}{x}, \frac{x^2 - (-x)^2}{x} \right)$$

$$\rightarrow R_g = \left[\frac{10}{x}, \frac{13}{x} \right) \rightarrow R_{g \circ f} = \left[-\frac{10}{x}, \frac{13}{x} \right)$$

$x \in [x+2] = x - [x] - 2$

$-\frac{3}{x}$