

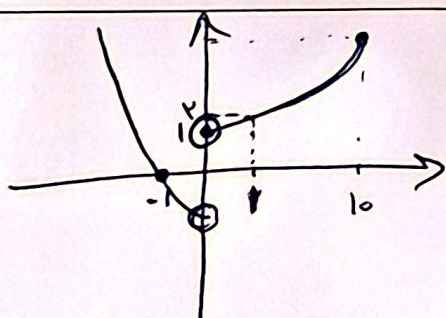
$(x+2)=+ \rightarrow f(+)= \begin{cases} 3(+2)+1: + \geq 3 \\ 4(+2)+1: + < 3 \end{cases} \quad x \leq \frac{1}{2}$
 $\xrightarrow{x \leq 1} (-\infty, 0] \cup (0, 2) \cup [2, +\infty)$

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

$D_f = (-\infty, 1]$

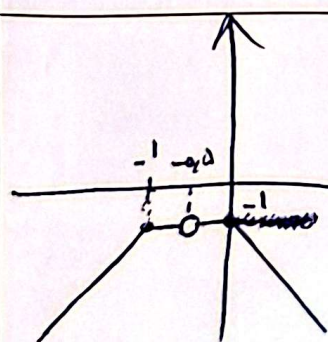
$f(f(x)) < f(x^3) \rightarrow f(x) < x^3$

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



$x > 0 \rightarrow x^3+1 \rightarrow$ اکیداً صعودی
 $x \leq 0 \rightarrow -x^3-1 \rightarrow$ اکیداً نزولی

تابع یک توانیم



$x = 0, 1, -1$
 $x < -1 \rightarrow$ اکیداً صعودی
 $-1 \leq x \leq 0 \rightarrow$ صعودی
 $0 < x \rightarrow$ اکیداً نزولی
 $D = (-\infty, 0] \rightarrow \boxed{a=0}$

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

برای صعودی بودن گناهیتم باید
 عبارت گاهش باشد.

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

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

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

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

صغوری آید

$$-27 + 9a - 3b + c = -1$$

$$f'(-3) = 0 \rightarrow 27 - 6a + b = 0 \quad (1)$$

$$27 - 6a + \frac{a^2}{3} = 0 \rightarrow a = 9$$

$$b = 27$$

$$c = 27$$

$$f(x) = x^3 + 9x^2 + 27x + 25 \Rightarrow 0 \rightarrow \text{کستین مقدار} = -2 \rightarrow k = -2$$

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

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

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

$$\left. \begin{array}{l} \rightarrow x - 2 \leq 0 \rightarrow x \leq 2 \\ D_f = [0, +\infty) \end{array} \right\} [0, 2] \rightarrow \text{صغوری آید}$$

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

$$\left. \begin{array}{l} \rightarrow \frac{\sqrt{10}}{2} - \frac{\sqrt{-10}}{2} = \frac{10}{2} - \frac{-10}{2} = \frac{10}{2} = b \\ \rightarrow \frac{\sqrt{-10}}{2} - \frac{\sqrt{10}}{2} = \frac{-10}{2} - \frac{10}{2} = -\frac{10}{2} = a \end{array} \right\} b - a = \frac{10}{2} + \frac{10}{2} = \frac{20}{2}$$

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

$$\rightarrow R_g = \left[\frac{10}{2}, \frac{5}{2} \right) \rightarrow R_{g \circ f} = \left[\frac{10}{2}, \frac{5}{2} \right)$$