

19,5

$$x^3 = \varepsilon$$

$$x > a$$

$$x^3 = \varepsilon = 12x - 2$$

$$12x - 2$$

$$x \leq a$$

$$x^3 - 12x + 14 = 0$$

$$x = 2$$

$$x. 12y - 2$$

$$12y, x, 2$$

$$12 - 2x + 14 = 0$$

$$x = 2$$

$$f(x) = \begin{cases} x^3 - \varepsilon & x > a \\ 12x - 2 & x \leq a \end{cases}$$

$$x > a$$

$$x^3 - \varepsilon > a^3 - \varepsilon$$

$$12a - 2. 5a^3 = \varepsilon \Rightarrow a^3 = 12a + 14$$

$$0 \leq (a - 2)^2 (a + 4)$$

$$- \frac{\varepsilon}{12} \leq a$$

$$- \varepsilon \leq a$$

$$a^3 - 12a + 14 = (a - 2)(a - 2)(a + 4) = (a - 2)^2 (a + 4)$$

$$a = [-\varepsilon + \infty)$$

$$f^{-1}(\varepsilon) = \varepsilon \Rightarrow f(\varepsilon) = \varepsilon$$

$$f(\varepsilon) = 12 + k \Rightarrow k = -1 \Rightarrow f(x) = 12x - 1$$

$$f(x) = 12x - 1$$

$$f(x) = 12x - 1$$

$$f(1) = 12 - 1 = 11$$

$$f(f(x)) = 12(12x - 1) - 1 = 144x - 13 = 144x - \varepsilon$$

$$144x - \varepsilon$$

$$f(x) = \frac{ax}{x-1} \Rightarrow f^{-1}(x) \Rightarrow$$

$$y = 5a$$

$$x = 2a$$

$$x = \frac{ay+0}{y-1}$$

$$\Rightarrow y = \frac{1+x}{x-a}$$

$$\Rightarrow y = \frac{x}{x-a}$$

$$\Rightarrow a = \frac{2a}{2a-a} = 2$$

$$a = 2$$

$$f(x) = \{(4, 9), (1, 1), (1, 8), (9, 1)\}$$

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$$g^{-1}(x) = \{(4, 9), (1, 1), (9, 1)\}$$

$$g(x) = \{(4, 9), (1, 1), (9, 1)\}$$

dotnote

$$f \circ f^{-1} = \{(4, 4), (6, 6), (7, 7), (9, 9)\} \quad \checkmark \text{ (الف)}$$

$$f^{-1} \circ f = \{(3, 3), (6, 6), (7, 7), (9, 9)\} \quad \checkmark$$

$$f \circ g^{-1} = \{(2, 4), (4, 2)\} \quad \checkmark$$

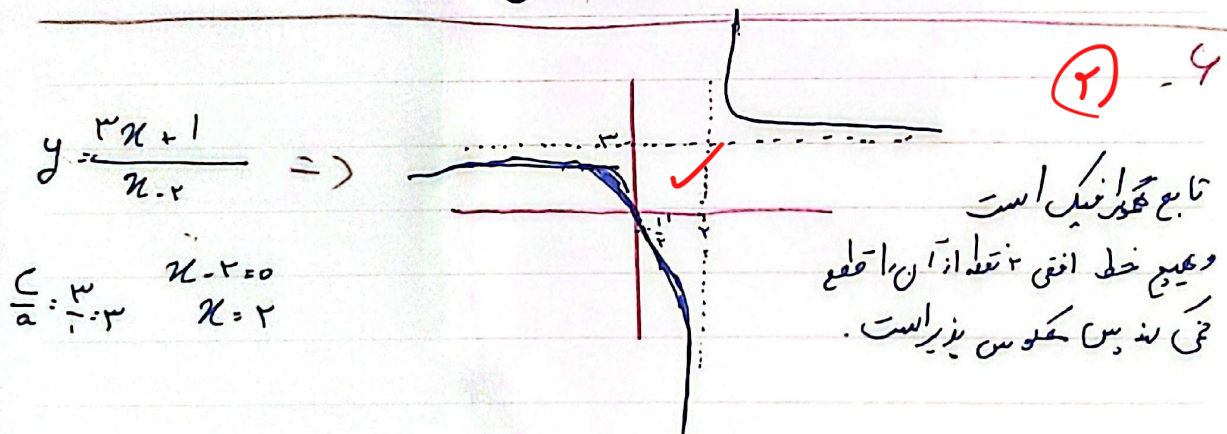
$$g^{-1} \circ f = \{(3, 9), (7, 3), (9, 1)\} \quad \checkmark$$

$$f \circ g^{-1} = \{(1, 4), (\overset{\text{۳} \swarrow}{6}, 1), (9, 0)\}$$

د - (۲)

$$\frac{h}{f \circ g^{-1}} = \left\{ \left(1, \frac{2}{4}\right), \left(3, \frac{4}{1}\right), \left(\cancel{5}, \frac{1}{0}\right) \right\} = \left\{ \left(1, \frac{1}{2}\right), \left(3, \frac{1}{4}\right) \right\} \quad \checkmark$$

تنگ



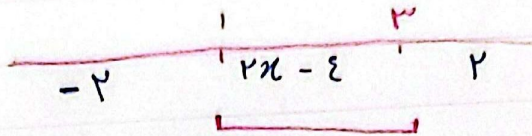
$x = \frac{3y+1}{y-2}$

$y = \frac{-12x+1}{x-3} = \frac{3x+1}{x-3} \quad \checkmark$

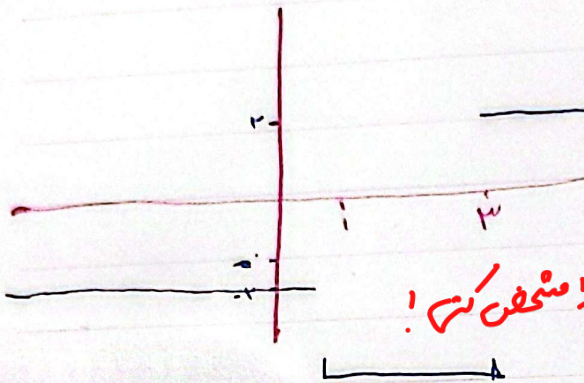
$\frac{3x+1}{x-3} = 0 \Rightarrow 3x+1=0 \Rightarrow x=-\frac{1}{3}$

$\frac{3x+1}{x-3} = 2 \Rightarrow 3x+1=2(x-3) \Rightarrow 3x+1=2x-6 \Rightarrow x=-7$

$$f(x) = |x-1| - |x-3|$$



1, 1.5



د بازه 3 تا 3

$$[a, b] = [1, 3]$$

همیشه وقتی معلوم تابع را بدست می‌دهی باید دامنه اش را مشخص کنی!

$$-2 \leq x \leq 2$$

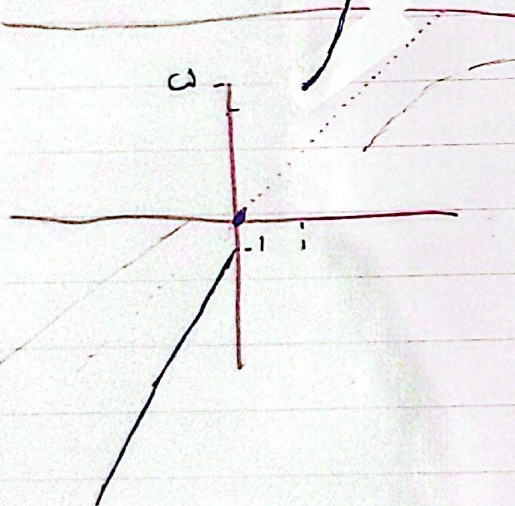
$$y = \frac{x}{2} + 2$$

$$y = x-1 + x-3 = 2x-4$$

$$x = \frac{y}{2} + 2$$

$$2y = x+4$$

$$y = \frac{x}{2} + 2$$



2

دارون باز است زیرا هیچ خط افقی 2 قطع

داخلمان قطع نمی کند.

$$f(x) = x^3 + 1 \quad : x \geq 1$$

$$f^{-1}(x) = \sqrt[3]{x-1} \quad ; x \geq 0$$

$$\frac{x+1}{2} \quad ; x \leq -1$$

$$x = y^3 + 1$$

$$y = \sqrt[3]{x-1}$$

$$x = 2y - 1$$

$$x = \frac{y+1}{2}$$

$$y = \sqrt[3]{x-1}$$

$$x \geq 0$$

$$y = \frac{x+1}{2}$$

$$x \leq -1$$

dotnote

$$f'(x)y = \frac{ax+b}{rx+d}$$

$$x = \frac{ay+b}{vy+d} \Rightarrow y = \frac{-xd+b}{xr-a}$$

7

$$\frac{b-xd}{rx-a} = \frac{x^{r+1}x^r - (x+1)^r}{x^{r+1}}$$

$$x^{r+1}x^r - x^r - 1 = (rx(x+1))^r - rx^{r-1} - 1 - rx^r - rx^r = -rx^{r-1}$$

$$\frac{b-xd}{rx-a} = \frac{-rx^{r-1}}{x^{r+1}} = \frac{-rx^{r-1}}{x^{r+1}} \Rightarrow a = -4 \checkmark$$

$$b = -r \checkmark$$

$$f(-x) = \frac{(-4x-r) - r}{-3+4} = \frac{10}{r} \Rightarrow \textcircled{3} \checkmark$$

3

$$y = \frac{x}{x+1}$$

$$x = \frac{y}{y+1} \Rightarrow x(y+1) = y$$

10

$$xy - y + x = 0$$

$$\Delta L, \frac{C}{a} = 1$$

$$y = \frac{1 \pm \sqrt{1-32x}}{rx}$$

مفرد نیست  
نقطه 1

$$D \neq R, R^{-1} = IR$$

$$D^{-1} = [-1, 0, \dots, 0] - \text{for}$$

$$x^r d = y \Rightarrow y = \frac{1 + \sqrt{1-32x}}{rx}$$