

(1, 75)

$$f(x) = |x-1| - |x-2|$$

$$[a, b] \rightarrow a=1, b=2$$

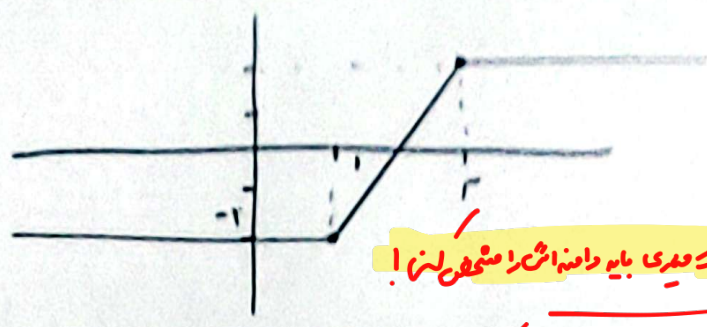
$$[1, 2] \checkmark$$

$$f(x) = x-1 + x-2 = 2x-3$$

$$y = 2x-3$$

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

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



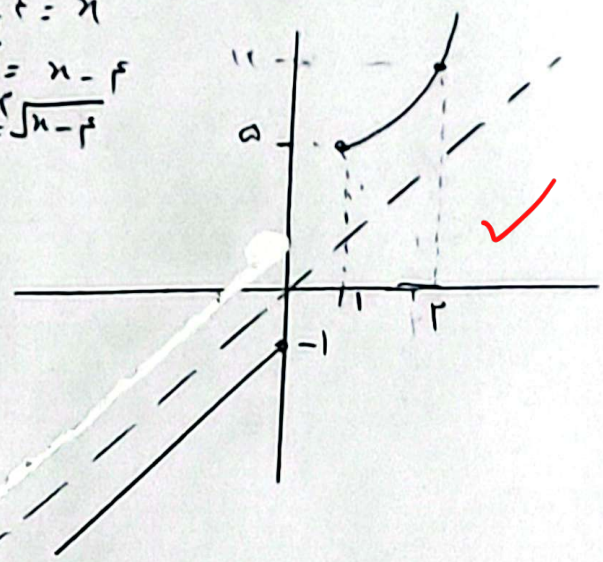
همیشه وقتی معلوم تابع را بدست می‌دهی باید دامنه اش را مشخص کنی!

$$f(x) = \begin{cases} x^2+1 & ; x \geq 1 \rightarrow y^2+1=x \\ x-1 & ; x \leq 0 \end{cases}$$

$$y^2 = x-1$$

$$y = \sqrt{x-1}$$

(2)



وارون بی است

$$f^{-1} = \begin{cases} \sqrt{x-1} & x \geq 1 \checkmark \\ \frac{x+1}{2} & x \leq -1 \checkmark \end{cases}$$

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

$$f(x) = \frac{x^2 - \frac{(x+1)^2}{x+2}}{x+2} \quad f^{-1}(x) = \frac{ax+b}{cx+d} \quad f^{-1}(b) = ?$$

(2) - 9

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

$$f^{-1}(-2) = \frac{-2(-2)-1}{2(-2)+2} = \frac{10}{-2} = -5 \quad d=2, b=-1, a=-4 \quad \frac{-4x-1}{2x+2} \checkmark$$

مخرج و صورت
x2

$$f(x) = \frac{x}{x^2+1} \quad y = \frac{x}{x^2+1} \rightarrow x = \frac{y}{y^2+1} \rightarrow y^2x+x = y$$

(1, 5)

وقت!

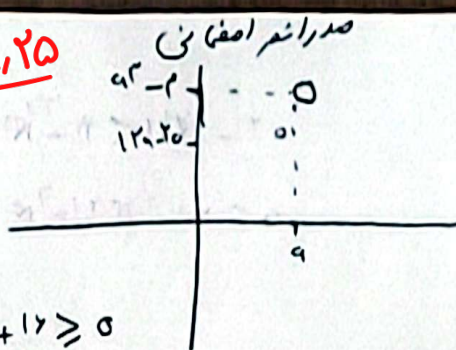
$$y = \frac{1 \pm \sqrt{1-4x^2}}{2x}$$

$$|x| \leq \frac{1}{2} - \{0\}$$

$$y^2x + x = y \rightarrow y^2x - y + x = 0$$

$$f(x) = \begin{cases} x^2 - 4 & ; x > 4 \\ 12x - 20 & ; x \leq 4 \end{cases}$$

19, 20



(2)

$$a^2 - 4 \geq 12a - 20$$

$$a^2 - 12a + 16 \geq 0$$

$$(a-2)(a-8) \geq 0$$

$$a \geq -f$$

$$f + 22 = 2 \Rightarrow \frac{-2 \pm 4}{2} = 1, -3$$

	-12	*
	-	+
		+

$$f(x) = 2x + k \quad f^{-1}(2) = 4$$

$$12 + k = 2$$

$$k = -10$$

(2)

$$a) f(4) \rightarrow 2 \cdot 4 - 10 = 18$$

$$b) f(f(x)) \rightarrow 2(2x - 10) - 10 \Rightarrow 4x - 20 - 10 \Rightarrow 4x - 30$$

$$\frac{a^2}{a-1} = 24$$

$$2a^2 - 24 = a^2$$

$$a^2 - 24 = 0$$

$$a(a-2) = 0$$

$$a = 2$$

چون اگر 0 باشد تابع ثابت می شود و تابع ثابت یک به یک نیست

(2)

$$f = \{(2, 4), (4, 2), (6, 4), (8, 2)\} \quad g = \{(2, 2), (4, 4), (6, 4), (8, 4)\}$$

$$f^{-1} = \{(4, 2), (2, 4), (4, 6), (2, 8)\} \quad g^{-1} = \{(2, 2), (4, 4), (6, 4), (8, 4)\}$$

$$a) f \circ f^{-1} = \{(2, 2), (4, 4), (6, 6), (8, 8)\}$$

$$b) f^{-1} \circ f = \{(2, 2), (4, 4), (6, 6), (8, 8)\}$$

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

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

(2)

$$f = \{(2,4) (4,8) (6,0)\} \quad g = \{(2,1) (4,3) (6,5)\} \quad h = \{(1,2) (2,4) (4,1) (5,2)\}$$

$$f \circ g^{-1} = \{(1,4) (2,8) (5,0)\} \quad g^{-1} = \{(1,2) (2,4) (5,6)\}$$

$$\frac{h}{f \circ g^{-1}} = \{(1, \frac{1}{4}) (2, \frac{1}{8})\} \quad \checkmark$$

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

یک به یک است ✓

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

$$f^{-1} = \frac{2x+1}{x-2} \quad \checkmark$$

افزودن به این روش شخص بردی
محول به خود با محورهای این نمودار رسم: