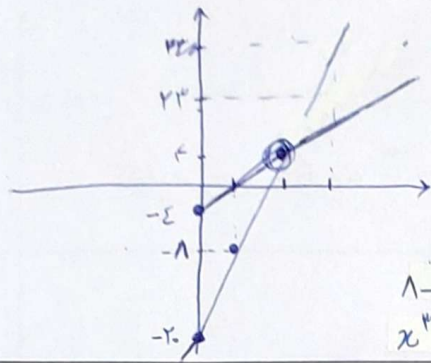
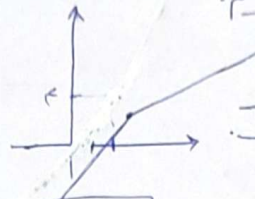




با توجه به



ابتدا در قسمت را بدون محاسبه رسم می کنیم:

خط افقی را عمودی می کنیم و یک نقطه قطع می کنند پس تا عمودی که به یک است.

$$a = 42$$

$$1 - 2 = 25 - 2$$

$$x^2 - 2 = 12x - 20 \rightarrow x = 2 \text{ (هر دو یک است)}$$

$$x^2 - 2 = y$$

$$12x - 20 = y$$

$$f(x) = 3x + k \rightarrow 12 + k = 2 \rightarrow k = -10 \Rightarrow f(x) = 3x - 10 \rightarrow 3y - 10 = x$$

$$f^{-1}(2) = 2$$

$$3y = x + 10$$

$$f^{-1}(x) = y = \frac{x + 10}{3}$$

$$\text{اگر } f(7) = 21 - 10 = 11$$

$$f(f(x)) \Rightarrow 3(3x - 10) - 10 = 9x - 30 - 10 = 9x - 40$$

$$g = \{(3, 2), (1, 4), (9, 5)\}, f = \{(3, 5), (4, 7), (7, 2), (9, 4)\}$$

$$g^{-1} = \{(2, 3), (4, 1), (5, 9)\}, f^{-1} = \{(5, 3), (7, 4), (2, 7), (4, 9)\}$$

$$\text{اگر } f \circ f^{-1} = \{(5, 5), (7, 7), (2, 2), (4, 4)\} \quad \text{ب) } f \circ f^{-1} = \{(3, 3), (4, 4), (7, 7), (9, 9)\}$$

$$\text{ج) } f \circ g^{-1} = \{(2, 5), (5, 4)\} \quad \text{د) } g^{-1} \circ f = \{(3, 9), (7, 3), (9, 1)\}$$

$$A(x, a)$$

$$f(x) = \frac{ax}{x-1} \rightarrow y = \frac{ax}{x-1} \rightarrow f^{-1}(x) = x = \frac{ay}{y-1} \rightarrow xy - x = ay \rightarrow xy - ay = x$$

$$y(x-a) = x$$

$$a = \frac{xa}{xa-a} \Rightarrow a = \frac{xa}{a} \rightarrow a = x$$

$$f^{-1}(x) = y = \frac{x}{x-a}$$

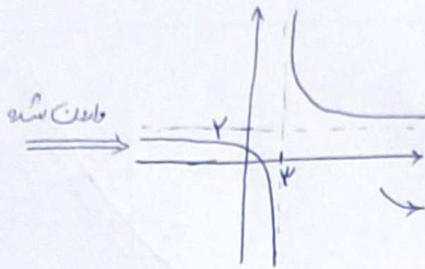
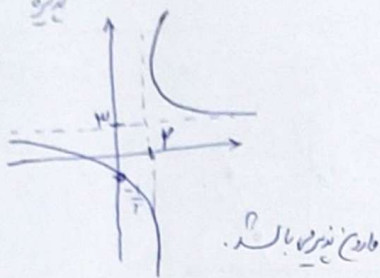
$$f = \{(2, 5), (5, 1), (4, 0)\}$$

$$g = \{(2, 1), (5, 3), (4, 5)\} \rightarrow g^{-1} = \{(1, 2), (3, 5), (5, 4)\} \quad f \circ g^{-1} = \{(3, 1)\}$$

$$h = \{(1, 2), (3, 5), (5, 1), (5, 1)\}$$

$$\frac{h}{f \circ g^{-1}} = \{(3, 4)\}$$

$$\frac{x^3+1}{x-2} \rightarrow \text{محل افقی و عمودی}$$

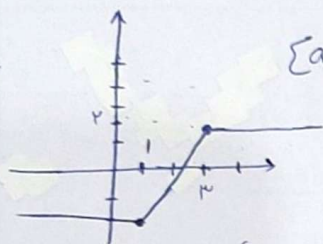


محل افقی و عمودی را با هم ترکیب کن

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

$$1-x$$



$$[a, b] \rightarrow [1, 3]$$

واردن آن قسمت

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

$$xy = x+2$$

$$b = -2 \quad (y = x+2)$$

$$2x+b=y \rightarrow 2+b=2 \Rightarrow 2x-2=y$$

$$(1, -2), (3, 2) \rightarrow \text{خط } y = \frac{x}{2} = 2$$

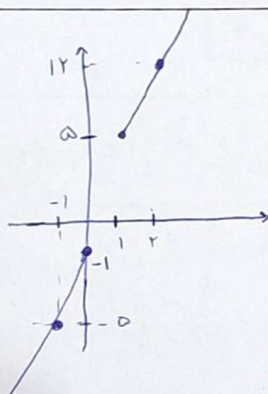
۷

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

$$R_{1,1} = [\infty, +\infty)$$

$$R_{1,2} = (-\infty, -1]$$

نواحی تابع واردن (نواحی تابع را با هم ترکیب کن)



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

$$D = [\infty, +\infty) \leftarrow y = \sqrt{x-2}$$

$$x-1=y \rightarrow xy-1=x \rightarrow xy=x+1$$

$$D = (-\infty, -1] \leftarrow y = \frac{x+1}{x}$$

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

$$f^{-1}(x) = \frac{ax+b}{cx+d} = \frac{-x^2+2x-1}{x+2} \rightarrow d=4, a=-4, b=-2$$

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$$f^{-1}(-1) = \frac{4-1}{-1} = -3$$

$$f(x) = \frac{x}{x^2+1} \rightarrow y = \frac{x}{x^2+1} \rightarrow yx^2+y=x \rightarrow yx^2-x+y=0 \quad x = \frac{1 \pm \sqrt{1-4y^2}}{2y} \quad y \neq 0$$

$$S_c: f^{-1}(y) = \frac{1 \pm \sqrt{1-4y^2}}{2y}$$

$$D_{f^{-1}} = \left[-\frac{1}{4}, \frac{1}{4}\right]$$

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