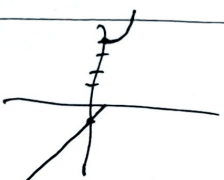


$$\begin{array}{c|c} 1 & 3 \\ \hline -2 & \sqrt{x-1} \\ \hline & 2 \end{array} \quad \text{حداقل} \quad \rightarrow [a, b] = [1, 3]$$

$$y \cdot 2x - 1 \xrightarrow{\text{باز کردن}} x = 2y - 1$$

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

۱. $\sqrt{x-1}$ 

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

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

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

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

$$x(y+1) = y^3 - y - 1 \quad x = \frac{y^3 - y - 1}{y+1} \rightarrow y = \frac{-1 \pm \sqrt{1-4x}}{2}$$

$$\frac{1(-1x-1)}{1(x+1)} \rightarrow \frac{-x-1}{x+1} = \frac{ax+b}{cx+d} \rightarrow \begin{cases} a = -1 \\ b = -1 \\ c = 1 \\ d = 1 \end{cases}$$

$$f^{-1}(6) = \frac{ab+b}{1b+a} \rightarrow \frac{b(a+1)}{1b+a} = \frac{1 \cdot 0}{1} = 0$$

۳. $f(x) = \frac{x}{x+1} \quad y = \frac{x}{x+1} \quad y(x+1) = x$

$$yx + x = y \quad x = \frac{1 \pm \sqrt{1-4y}}{2} \quad x = y + 1 \rightarrow y = \frac{1 \pm \sqrt{1-4x}}{2x}$$

$$1) \quad x=a \rightarrow a^2 \cdot \varepsilon = 12a - 1 \rightarrow a^2 \cdot 12a + 12 = 0$$

$$\xrightarrow{a=2} (a-2)(a^2+12a-1) \rightarrow \underbrace{(a-2)^2}_{+0, a=0} (a+2)$$

$$a+\varepsilon \geq 0 \rightarrow a \geq -\varepsilon$$

(5)

$$2) \quad f(x) = 3x + 1 \quad f^{-1}(x) = \varepsilon \rightarrow f(\varepsilon) = 1 \rightarrow f(\varepsilon) = 3\varepsilon + 1$$

$$x=1 \rightarrow f(x) = 3x - 1$$

$$الف) \rightarrow 3(v) - 1 = 11$$

$$ب) 3(3x - 1) - 1 = 9x - 4$$

(5)

$$3) \quad A(M, a) \xrightarrow{\text{تبدیل}} f(x) = \frac{ax}{x-1} \Rightarrow A(a, 1a) \text{ عکس}$$

$$x=a \rightarrow \frac{a(a)}{a-1} = 1a \cdot \frac{a^2}{a-1} = 1a \rightarrow a^2 - 1a = 0$$

$$a(a-1) = 0 \quad \left[\begin{array}{l} a=2 \\ a=0 \end{array} \right] \xrightarrow{a \neq 1} \text{اگر } a=0 \text{ باشد} \rightarrow a=1$$

(5)

$$4) \quad الف) [(1,1), (2,2), (3,3), (4,4)]$$

$$ب) [(1,1), (2,2), (3,3), (4,4)]$$

$$ج) [(1,1), (2,2), (3,3), (4,4)]$$

$$د) [(1,1), (2,2), (3,3), (4,4)]$$

طوری (2)

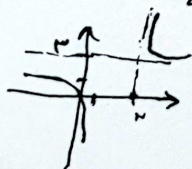
(5)

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

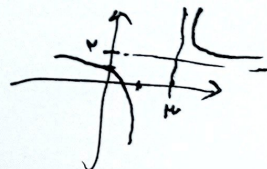
$$\frac{h}{f \circ g^{-1}} = [(1, \frac{1}{2}), (2, \frac{1}{3}), (3, \frac{1}{4})]$$

(5)

$$6) \quad y = \frac{3x+1}{x-2} \quad x=2 \text{ به } y=1 \text{ تبدیل می شود} \rightarrow z = \frac{3y+1}{y-2} \rightarrow y = \frac{3z+1}{z-2}$$



$$x=2 \\ y=1$$



(5)