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$$a^3 - \epsilon > 12a - 14 \quad a^3 - 12a + 14 > 0$$

$$\begin{array}{r} a^3 - 12a + 14 \\ - a^3 + 12a \\ \hline 14 \\ - 12a + 14 \\ \hline 14 - 12a \\ \hline 14 - 12a \\ \hline 0 \end{array}$$

$$(a-1)(a^2+2a-1) > 0$$

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-1 2

- + +

$$[-1, +\infty) - \{1\}$$

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$$f(\epsilon) = 2 \rightarrow f(\epsilon) = 3(\epsilon) + k \rightarrow 2 = 3\epsilon + k \quad k = -10 \quad f(x) = 3x - 10$$

$$f(0) = 3(0) - 10 = -10$$

$$f(4n) = 3(4n) - 10 = 12n - 10 = 2(6n - 5)$$

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$$f\left(\frac{ax}{x-1}\right) = x \rightarrow f\left(\frac{ax}{x-1}\right) = a \rightarrow f(a) = \frac{ax}{x-1} \quad \frac{ax}{x-1} = a \quad a^2 = \frac{ax}{x-1} \rightarrow a^2 - \frac{ax}{x-1} = 0$$

$$a(a-1) = 0 \quad \left\{ \begin{array}{l} 0 \\ 1 \end{array} \right\}$$

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$$\begin{array}{l} f(f(x)) \\ 3 \rightarrow 5 \rightarrow 3 \\ 5 \rightarrow 4 \rightarrow 5 \\ 4 \rightarrow 2 \rightarrow 4 \\ 2 \rightarrow 1 \rightarrow 2 \end{array} \quad f^{-1}(f(x)) = \{(3,3), (5,5), (4,4), (2,2)\}$$

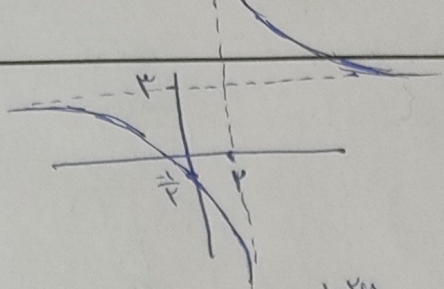
$$\begin{array}{l} g^{-1}(f(x)) \\ 3 \rightarrow 5 \rightarrow 4 \\ 5 \rightarrow 4 \rightarrow 2 \\ 4 \rightarrow 2 \rightarrow 1 \\ 2 \rightarrow 1 \rightarrow 3 \end{array} \quad g^{-1}(f(x)) = \{(3,4), (5,2), (4,1)\}$$

$$\begin{array}{l} f(g^{-1}(x)) \\ 5 \rightarrow 4 \rightarrow 0 \\ 3 \rightarrow 5 \rightarrow 1 \\ 1 \rightarrow 2 \rightarrow 3 \end{array} \quad f \circ g^{-1} = \{(5,0), (3,1), (1,3)\}$$

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

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

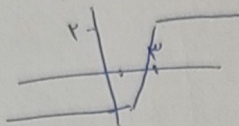
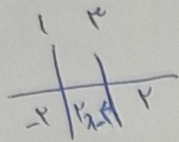
$$x=0 \rightarrow y = -1$$



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

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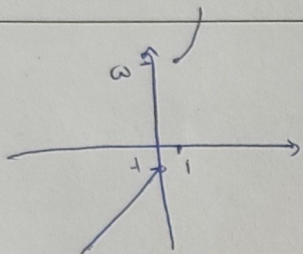


$$[a, b] = [1, 2]$$

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

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$$f(x) = \begin{cases} x+1 & x \geq 1 \\ x-1 & x < 1 \end{cases}$$

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

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

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$$f(x) = \frac{x^2(x+1) - (x+1)^2}{x+1} = \frac{x^3 + x^2 - x^2 - 2x - 1}{x+1} = \frac{x^3 - 2x - 1}{x+1}$$

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

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

$$\frac{-1-2x}{x+1} = \frac{ax+b}{cx+d} \\ \downarrow \\ \frac{-1-2x}{x+1} = \frac{bx+b}{cx+d} \\ \frac{b}{c} = -1 \quad \frac{b}{d} = -1 \quad \frac{d}{c} = 1$$

$$f^{-1}(b) = f^{-1}(-1) = \frac{-1+1}{-1+1} = \frac{0}{0} = \omega$$

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

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

$$y = \frac{1 \pm \sqrt{1-4x}}{2} \quad D = x \leq 0$$

$$f(x) = \frac{1 \pm \sqrt{1-4x}}{2}$$

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