

$$x^3 - 4 \quad x > a \rightarrow (a, +\infty)$$

$$12x - 20 \quad x \leq a \rightarrow (-\infty, a]$$

$$a = 2$$

$$\begin{aligned} & \xrightarrow{2} a \xrightarrow{2} (4, +\infty) \xrightarrow{2} \text{مجموعه } 1, 2, 3 \\ & \xrightarrow{2} (-\infty, 4) \end{aligned}$$

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

$$\frac{2 - K}{3} = 4 \quad 2 - K = 12 \quad \boxed{K = -10}$$

$$\text{انف) } f(7) = 3(7) - 10 = \boxed{11}$$

$$\rightarrow f(f(x)) = 3(3x - 10) - 10 = \boxed{9x - 40}$$

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$$y = \frac{ax}{x-1} \rightarrow yx - y = ax \quad x(y-a) = y \quad x = \frac{y}{y-a} \quad y = \frac{x}{x-a}$$

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$$f^{-1}: \{(\omega, 3)(\nu, 4)(\rho, 7)(\epsilon, 9)\} \quad g^{-1}: \{(2, 3)(4, 8)(\omega, 9)\}$$

$$\text{انف) } f \circ f^{-1}: \{(\omega, \omega)(\nu, \nu)(\rho, \rho)(\epsilon, \epsilon)\} \quad \text{ج) } f \circ g^{-1}: \{(2, \omega)(\omega, 6)\}$$

$$\rightarrow f^{-1} \circ f: \{(3, 3)(4, 4)(7, 7)(9, 9)\} \quad \rightarrow g^{-1} \circ f: \{(3, 9)(7, 3)(9, 8)\}$$

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$$g^{-1}: \{(1, 2)(3, 4)(\omega, 6)\}$$

$$f \circ g^{-1}: \{(1, 4)(3, 8)(\omega, 0)\}$$

$$\frac{h}{f \circ g^{-1}} = \left\{ \left(1, \frac{1}{4}\right) \left(3, \frac{1}{8}\right) (\omega, 0) \right\}$$

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

$$f^{-1}(x) = \frac{x+5}{2} \quad x \in [-2, 2]$$

$$x \leq 1 \quad f(x) = -2$$

$$1 \leq x \leq 3 \quad \underline{f(x) = 2x-4} \quad [-2, 2] \rightarrow \text{غیر یکتا}$$

$$x \geq 3 \quad f(x) = 2$$

$$x^3 + 5 \xrightarrow{(1)} \omega \Rightarrow [\omega, +\infty)$$

$$5x-1 \xrightarrow{(2)} -1 \Rightarrow (-\infty, -1]$$

$$y = x^3 + 5 \rightarrow y = \sqrt[3]{x+5}$$

$$y = 5x-1 \rightarrow y = \frac{x+1}{5}$$

$$f(x) = \begin{cases} \sqrt[3]{x-5} & x \geq \omega \\ \frac{x+1}{5} & x \leq -1 \end{cases}$$

$$y = \frac{\cancel{2x^3} + \cancel{4x^3} - \cancel{2x^3} - \cancel{4x^3} - 3x - 1}{x+3} \rightarrow y = \frac{-3x-1}{x+3}$$

$$b = (-1) \quad y = \frac{-3(-1)-1}{-1+3} \rightarrow \frac{2}{2} = 1$$