

بالترتيب

دالة

٢٥

الطرف الثاني

$$f(x) = \begin{cases} x^3 - \varepsilon & x > a \rightarrow \min = a^3 - \varepsilon \\ 11x - 20 & x \leq a \rightarrow \max = 11a - 20 \end{cases} \quad [-\varepsilon, +\infty) \leftarrow$$

$$11a - 20 \leq a^3 - \varepsilon$$

$$a^3 - 11a + 19 \geq 0$$

$$(a-2)^2(a+5) \geq 0$$

$$\begin{array}{c} -\varepsilon \quad \varepsilon \\ -\phi \quad \phi \end{array}$$

$$f(x) = 3x + k \quad \text{ان} \quad f(v) = ? \quad 3(v) - 10 = 11$$

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

$$f(v) = v \quad f(v) = 11 + k = v \rightarrow k = -10$$

$$f(f(x)) = 3f(x) + k = 3(3x - 10) - 10 = 9x - 40$$

$$A(2a, a) \quad f(x) = \frac{ax}{x-1} \rightarrow a = ?$$

$$\frac{ax + 0}{x - 1} \rightarrow \frac{-a}{x - a} \quad \frac{2a}{2a - a} = \frac{2a}{a} = 2 = a$$

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

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

$$\text{ان} \quad f(f^{-1}(x)) \quad x \xrightarrow{f^{-1}} v \xrightarrow{f} x \quad \text{ب} \quad f^{-1}(f(x)) \quad x \xrightarrow{f} v \xrightarrow{f^{-1}} x$$

$$\{(2, 2), (3, 3), (4, 4)\}$$

$$2 \rightarrow 2 \rightarrow 2$$

$$\{(3, 3), (2, 2), (4, 4)\}$$

$$3 \rightarrow 3 \rightarrow 3$$

s.a.m

$$f(x) = |x-1| - |x-3| \rightarrow [a, b] \text{ یکتا}$$

$$\left\{ \begin{array}{l} x < 1 \rightarrow 1-x - (3-x) = 1-x-3+x = -2 \quad \times \\ 1 \leq x \leq 3 \rightarrow x-1 - (3-x) = x-1-3+x = 2x-4 \quad \checkmark \\ x > 3 \rightarrow x-1 - (x-3) = x-1-x+3 = 2 \quad \times \end{array} \right.$$

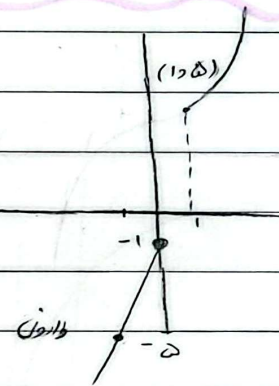
$$[a, b] = [1, 3]$$

$$y = 2x - 4 \xrightarrow{\text{جواب}} x = \frac{y+4}{2}$$

$$2y = x + 4 \quad y = \frac{1}{2}x + 2; \quad x \in [-2, 2]$$

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

$$\begin{cases} x = y^2 + 2 \\ y^2 = x - 2 \end{cases}$$



یک به یک نیست

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

$$x = y^2 + 2 \quad y^2 = x - 2 \quad y = \frac{1}{2}x + \frac{1}{2} \leq 0$$

$$f(x) = \frac{(x+3)(x+1)^2}{x+2} \rightarrow f^{-1} = \frac{ax+b}{cx+d}$$

$$f^{-1}(b) = ?$$

$$\frac{x^3 + 3x^2 + 3x + 1}{x+2} = \frac{-3x-1}{x+2} \xrightarrow{\text{جواب}} f^{-1} = \frac{-3x-1}{x+2} = \frac{-4x-2}{x+4}$$

$$\begin{aligned} a &= -4 \\ b &= -2 \\ d &= 4 \end{aligned}$$

$$f^{-1}(-1) = \frac{-4(-1)-2}{-2+4} = \frac{1}{2} = \textcircled{5}$$

s.a.m

$$f(x) = \frac{x}{x^r + 1}$$

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

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

(b)

$$xy^r + x = y$$

$$xy^r + x - y = 0$$

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

$$\Delta = 1 - 4r(x) = 1 - 4rx$$

5

s.a.m