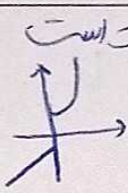


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$$f(x) = \begin{cases} x^3 - 4 & x > a \\ 12x - 6 & x \leq a \end{cases}$$



تابع یکپارچه و پیوسته دو تابع و هم‌صورت هم‌الیه قطعی است
بسیار دقت این است که $12a - 6 = a^3 - 4$ (نویسند)

$$\begin{aligned} x^3 - 4 + 20 - 12x &> 0 \\ x^3 - 12x + 16 &> 0 \\ -12x + 16 & \rightarrow (x+4)(x-2) \\ x^3 - 12x + 16 & \rightarrow (x+4)(x-2)^2 \\ (x-4)(x+4) & \rightarrow (x+4)(x-4)(x+4) \end{aligned}$$

$a > -4$

$f(v)$ الف

$f(f(x))$ ب

$f(x) = 3x + k$

$f(v) = 21 - 10 = 11$

$f(3x - 6) = 3(3x - 6) - 10 = 9x - 28$

$f^{-1}(2) = 4$

$\hookrightarrow f(4) = 2 \xrightarrow{\text{با توجه به } f(x)} f(4) = 12 + k = 2 \rightarrow \boxed{k = -10} \rightarrow f(x) = 3x - 10$

$x \in D_{f^{-1}}$

$A = (x, a) \rightarrow f^{-1}(x) = a \rightarrow f(a) = 2a$

اگر $a = 0$ شود $f(x) = 0$ و x را در $D_{f^{-1}}$ نمی‌نویسند
 $a = 2$ می‌شود

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

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

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

ج) $f \circ g^{-1} = \{(2, 5), (5, 4)\}$ د) $g^{-1} \circ f = \{(3, 9), (7, 3), (9, 8)\}$

$f = \{(2, 4), (4, 8), (6, 0)\}$ / $g = \{(2, 1), (4, 3), (6, 5)\}$ / $h = \{(1, 2), (3, 4), (5, 6)\}$
 $g^{-1} = \{(1, 2), (3, 4), (5, 6)\}$

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$h \circ f \circ g^{-1}$

$1 \rightarrow 2 \rightarrow 4 \rightarrow \frac{4}{2} = 2$
 $3 \rightarrow 4 \rightarrow 8 \rightarrow \frac{8}{4} = 2$
 $5 \rightarrow 6 \rightarrow 0 \rightarrow \frac{0}{6} = 0$
 $\frac{h(x)}{f(g^{-1}(x))} \rightarrow \frac{2}{2} = 1$
 $\frac{h}{f \circ g^{-1}} = 1 \rightarrow \{(1, 1), (2, 1), (3, 1)\}$

مخرج مشترک

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$f^{-1}(x) = \begin{cases} \frac{1}{3}x + 1 & \text{if } x \geq 3 \\ \sqrt[3]{x-1} & \text{if } x < 3 \end{cases}$

$$\hookrightarrow x_2 - \frac{y_2 g_1}{y_1 w} \Bigg\} y_2 \frac{y_1}{x_1 w}$$

$\bullet \frac{1 + \sqrt{1 - \epsilon_{\text{rel}}^2}}{\gamma_{\text{rel}}} \leq 1$

$\frac{1 + \sqrt{1 - \epsilon_{\text{rel}}^2} - \gamma_{\text{rel}}}{\gamma_{\text{rel}}} \leq 0$

$$\frac{29x - 29x^2 - 1 - 49x^2}{29x}$$
 است بارنامه [پاره لاله و $\frac{1}{2}$]