

علی خزان - توفیق ۱۱

تاریخ: / /

۱- چون f یک به یک است و دامنه اش برای f تمام $\mathbb{R}$ است

هم به برای $a \in \mathbb{R}$ که $(a, f(a))$ یک به یک است. $a \in \mathbb{R}$

$$f^{-1}(2) = 4 \Rightarrow f(4) = 2 \Rightarrow f(4) = 3(4) + k \Rightarrow k = 10$$

الف) $f(v) = (3v + 10) + \log 3$

ب) $f(f(x)) = f(3x + 10) = 3(3x + 10) + 10 + \log 3 = 9x + 40 + \log 3$

$$y = \frac{ax}{x-1} \xrightarrow{\text{داده}} x = \frac{ay}{y-1} \rightarrow a = \frac{a^2}{a-1}$$

$$\rightarrow 2a^2 - 2asa^2 \rightarrow a^2 - 2a = 0 \rightarrow a(a-2) = 0 \rightarrow \begin{cases} a = 2 \\ a = 0 \end{cases}$$

$$f^{-1}(n) = \{ (1,3), (2,4), (3,1), (4,2) \} \quad g^{-1}(n) = \{ (1,3), (2,4), (3,1) \}$$

$$\text{الف) } f(f^{-1}(n)) = \{ (1,3), (2,4), (3,1), (4,2) \} \quad -K$$

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

$$ب) f(g^{-1}(n)) = \{ (1,3), (2,4) \}$$

$$ج) g^{-1}(f(n)) = \{ (1,3), (2,4), (3,1) \}$$

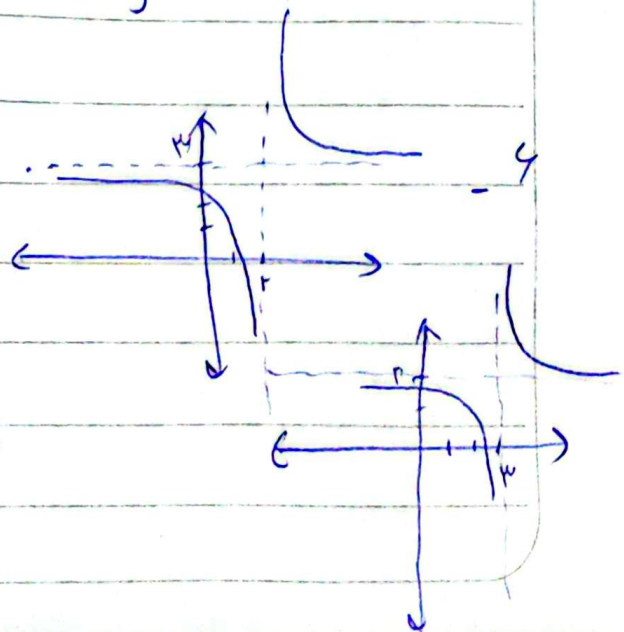
$$g^{-1}(n) = \{ (1,3), (2,4), (3,1) \} \quad -Q$$

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

$$D \text{ of } f \circ g^{-1} = \{ 1, 3, 4 \} \rightarrow \frac{h}{f \circ g^{-1}} = \{ (1, \frac{1}{4}), (3, \frac{1}{4}), (4, \frac{1}{4}) \}$$

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

مجاوبات: $x = 2$
مجاوبات: $y = 3$

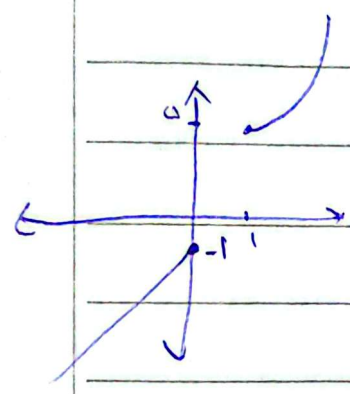


$$y = \frac{x^3 + 1}{x - 2} \rightarrow y = \frac{x^3 + 1}{x - 3}$$

مجاوبات: $x = 3$
مجاوبات: $y = 2$

$f(x) = |x-1| - |x-3|$ (1) (3)
 $1-x-3+x-1 = 1-x-(3-x)$ 1 3
 $x-1-(3-x)$
 $x-1-3+x = 2x-4$
 $[a, b] = [1, 3]$

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



Prob: $f^{-1}(x) = \begin{cases} y = \sqrt{x-4} & x \geq 4 \\ y = \frac{x+4}{2} & x \leq 4 \end{cases}$

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

$\rightarrow f^{-1}(x) = \frac{-4x-2}{2x+4} \rightarrow b = -2$

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

$y = \frac{x}{x^2+1} \rightarrow x = \frac{y}{y^2+1} \rightarrow xy^2 + x = y$

$\rightarrow xy^2 - y + x = 0 \rightarrow y = \frac{1 \pm \sqrt{1-4(x^2)}}{2x} \rightarrow f^{-1}(x) = \frac{1 \pm \sqrt{1-4x^2}}{2x}$