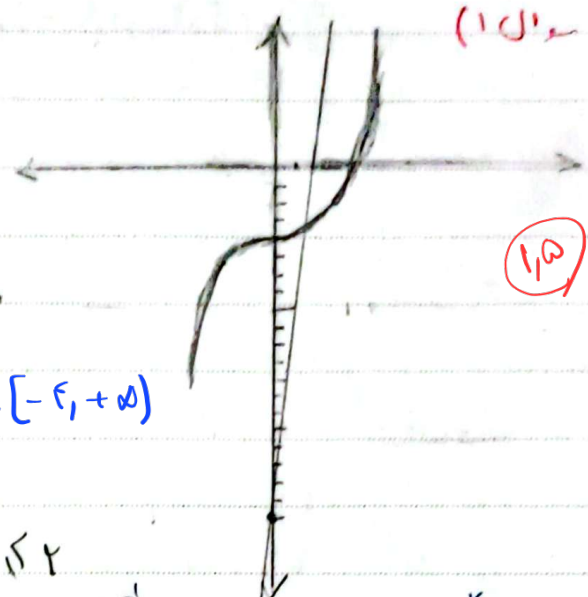


19, 5

در باب مصادیق زائده

$$f(n) = \begin{cases} n^3 - \varepsilon; & n > a \\ 12n - 2; & n \leq a \end{cases}$$



$$n^3 - \varepsilon = 12n - 2 \Rightarrow n^3 - 12n + 14 = 0$$

$$\Rightarrow (n-2)^2(n+7) = 0$$

$$\frac{-f}{f'}$$

$$a \in [-7, +\infty)$$

$$n \leq 2, n \leq -7 \text{ } \cup \cup \varepsilon$$

$$\begin{array}{r|l} n^3 - 12n + 14 & n-2 \\ -n^3 + 2n^2 & n^2 + 2n - 1 \end{array} \Rightarrow a \leq 2$$

$$\begin{array}{r|l} 2n^2 - 12n + 14 & -n + 14 \\ -2n^2 + 4n & -n + 14 \end{array}$$

$$1) f(v) =$$

$$K = -10 \leftarrow \frac{r-K}{r} \varepsilon$$

$$f^{-1}(r) = \varepsilon, f(n) = 3n + K$$

$$f^{-1}(r) \leftarrow f^{-1}(n) = \frac{n-K}{3}$$

$$f(n) = 3n - 10 \xrightarrow{f(v)} f(v) = (3 \times v) - 10 = 11$$

$$2) f(f(n)) = 3(3n + K) + K = 9n + 3K + K = 9n + 4K \Rightarrow 9n - \varepsilon$$

$$f(n) = \frac{an}{n-1} \quad A(a, a)$$

$$\Rightarrow f^{-1}(n) \Rightarrow n = \frac{ay}{y-1} \Rightarrow ny - n \leq ay \Rightarrow ny - ay = n$$

$$y(n-a) \leq n$$

$$y \leq \frac{n}{n-a}$$

$$f^{-1}(n) = \frac{n}{n-a} \xrightarrow{(1, a, a)} \frac{ya}{ya-a} = a$$

$$y = a$$

(3 سوال)

(2)

$$g = \{(3,2), (1,4), (7,8)\} \quad f = \{(3,8), (2,5), (5,1)\} \quad (9 \text{ ماركات})$$

$$g^{-1} = \{(2,3), (4,1), (8,7)\} \quad f^{-1} = \{(8,3), (5,2), (1,5), (4,7)\}$$

1) $f \circ f^{-1}$ $8 \rightarrow 3 \rightarrow 8, 5 \rightarrow 2 \rightarrow 5, 1 \rightarrow 5 \rightarrow 1, 4 \rightarrow 7 \rightarrow 4$

$$= \{(8,8), (5,5), (1,1), (4,4)\}$$

2) $f^{-1} \circ f$ $3 \rightarrow 8 \rightarrow 3, 2 \rightarrow 5 \rightarrow 2, 5 \rightarrow 1 \rightarrow 5, 7 \rightarrow 4 \rightarrow 7$

$$= \{(3,3), (2,2), (5,5), (7,7)\}$$

3) $f \circ g^{-1}$ $2 \rightarrow 3 \rightarrow 8, 4 \rightarrow 1 \rightarrow 4, 8 \rightarrow 7 \rightarrow 4$

$$\{(2,8), (4,4)\}$$

4) $g^{-1} \circ f$ $3 \rightarrow 8 \rightarrow 4, 2 \rightarrow 5 \rightarrow 1, 5 \rightarrow 1 \rightarrow 3, 7 \rightarrow 4 \rightarrow 7$

$$= \{(3,4), (4,1), (1,3)\}$$

5) $h = \{(1,2), (3,4), (5,6)\}, g = \{(2,1), (4,3), (6,5)\}, f = \{(1,3), (3,5), (5,7)\}$

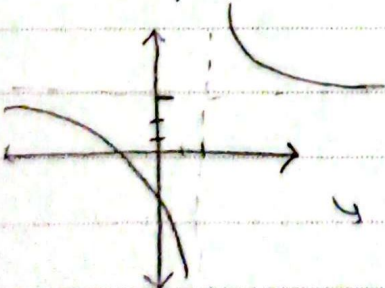
$$g^{-1}(m) = \{(1,2), (3,4), (5,6)\}$$

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

$$\rightarrow 1 \rightarrow 2 \rightarrow 1, 3 \rightarrow 4 \rightarrow 3, 5 \rightarrow 6 \rightarrow 5$$

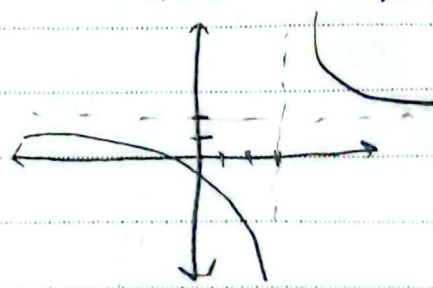
$$\Rightarrow f \circ g^{-1} = \{(1,1), (3,3), (5,5)\}$$

$$y = \frac{2n+1}{n-2}$$



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$$n = \frac{2y+1}{y-2} \Rightarrow ny - 2n = 2y+1$$

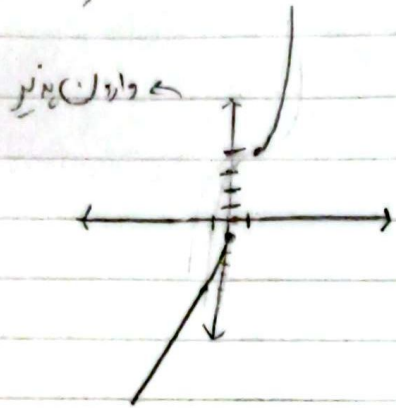
$$y(n-2) = 2n+1 \Rightarrow y = \frac{2n+1}{n-2}$$

Arman

سوال (۷) $f(n) \leq n-1$ و $|n-3|$ در بازه $[a, b]$ داریم. بیابان.

$$\begin{array}{c|c|c} 1 & 3 & \\ \hline -n+1+n-2 & n-1+n-2 & n-1-n+3 \\ \hline -2 & 2n-2 & 2 \end{array} \Rightarrow \begin{array}{l} a=1 \\ b=3 \end{array}$$

$$n = 2y - 2 \rightarrow \frac{n+2}{2} \leq y$$



$$f(n) \leq \begin{cases} n^3 + 2 & ; n \geq 1 \\ 2n - 1 & ; n < 1 \end{cases}$$

$$n = y^3 + 2 \rightarrow \sqrt[3]{n-2} \leq y$$

$$D_{f^{-1}} = R_f \Rightarrow 1 \rightarrow (1)^3 + 2 = 3 \rightarrow D_{f^{-1}} = [3, +\infty)$$

$$n = 2y - 1 \rightarrow \frac{n+1}{2} \leq y \rightarrow D_{f^{-1}} = (-\infty, -1]$$

$$\Rightarrow f^{-1}(n) \leq \begin{cases} \sqrt[3]{n-2} & ; n \geq 3 \\ \frac{n+1}{2} & ; n < -1 \end{cases}$$

$$f^{-1}(b) \leq ? \quad f^{-1}(n) \leq \frac{an+b}{cn+d}, \quad f(n) \leq n^3: \frac{(n+1)^3}{n+3}$$

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

و نیز

$$\Rightarrow n \leq \frac{-(1+3y)}{y+3} \Rightarrow ny + 3n = -1 - 3y$$

$$ny + 3y = -1 - 3n$$

$$y(n+3) = -(1+3n)$$

$$y \leq \frac{-(1+3n)}{n+3} = f^{-1}(n)$$

$$\frac{-1-3n}{n+3} = \frac{an+b}{cn+d} \Rightarrow \frac{-4n-1}{3n+4} \leq \frac{an+b}{cn+d} \Rightarrow b = -1$$

$$f^{-1}(-1) = \frac{-1+4}{1} = 3$$

NEGARNOTE

D _____

S _____

$$f(n) = \frac{n}{n^2+1} \rightarrow n = \frac{y}{y^2+1} \rightarrow ny' + n^2y$$

(سوال ۱)

(۲)

$$ny^2 - y + n^2 = 0$$

$$\rightarrow y = \frac{1 \pm \sqrt{1 - 4n^2}}{2n} \quad \frac{y, n}{\text{مقادیر}}$$

- $\varepsilon(n)$ - $\varepsilon(n)(n)$

$$y = \frac{1 + \sqrt{1 - 4n^2}}{2n}$$