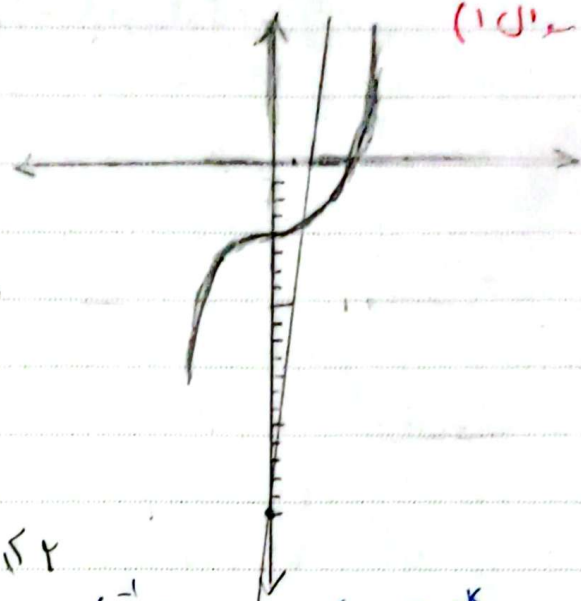


$$f(n) = \begin{cases} n^3 - \varepsilon; & n > a \\ 12n - 2; & n \leq a \end{cases}$$



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

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

$$n = 2, n = -7 \text{ (نقص)}$$

$$\begin{array}{r} n^3 - 12n + 14 \quad | \quad n-2 \\ -n^3 + 2n^2 \\ \hline 2n^2 - 12n + 14 \\ -2n^2 + 4n - 4 \\ \hline -8n + 18 \end{array} \Rightarrow a \leq 2$$

$$\begin{array}{r} 2n^2 - 12n + 14 \\ -2n^2 + 4n - 4 \\ \hline -8n + 18 \end{array} \Rightarrow -8n + 18 = 0 \Rightarrow n = \frac{18}{8} = 2.25$$

$$f^{-1}(2) = \varepsilon, f(n) = 3n + K \quad (2 \text{ سوال})$$

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

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

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$$f(n) = \frac{9n}{n-1} \quad A(2, a)$$

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

$$y(n-a) \leq n \Rightarrow y \leq \frac{n}{n-a}$$

$$f^{-1}(n) = \frac{n}{n-a} \xrightarrow{(1, a, a)} \frac{1 \times a}{1 \times a - a} = \frac{a}{0} = \infty$$

$$y = a$$

$$f(n) = \frac{9n}{n-1}$$

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

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

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

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

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

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

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

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

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

$$\{(2,8), (4,5)\}$$

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

$$= \{(3,4), (2,1), (5,2)\}$$

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

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

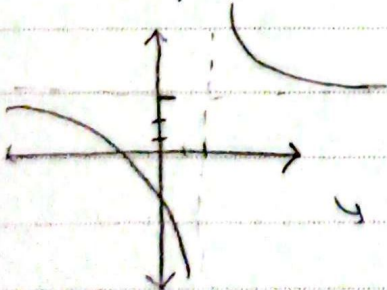
$$g^{-1}(m) = \{(2,1), (3,2), (5,4)\}$$

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

$$\rightarrow 1 \rightarrow 2 \rightarrow 4, 3 \rightarrow 4 \rightarrow 1, 5 \rightarrow 2 \rightarrow 0$$

$$\Rightarrow f \circ g^{-1} = \{(1,4), (3,1), (5,0)\}$$

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

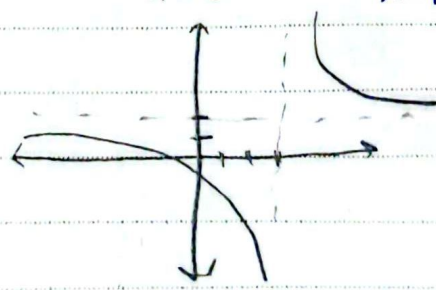


نقطة (1, -1/2)

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

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

(4 مقرر)



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

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

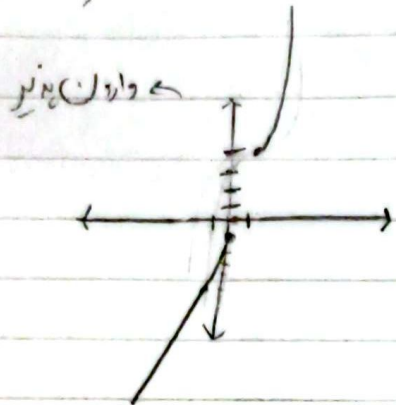
Arman

دانشگاه آزاد اسلامی [a, b] در بازه $f(n) \leq n-1 \leq n+3$

سوال (۷)

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

NEGARNOTE

D _____

S _____

$$f(n) = \frac{n}{n^2+1} \rightarrow n = \frac{y}{y^2+1} \Rightarrow ny' + n = y \quad \text{سوال 1.0}$$

$$ny' - y + n = 0$$

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

$$- \varepsilon(n)$$

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

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