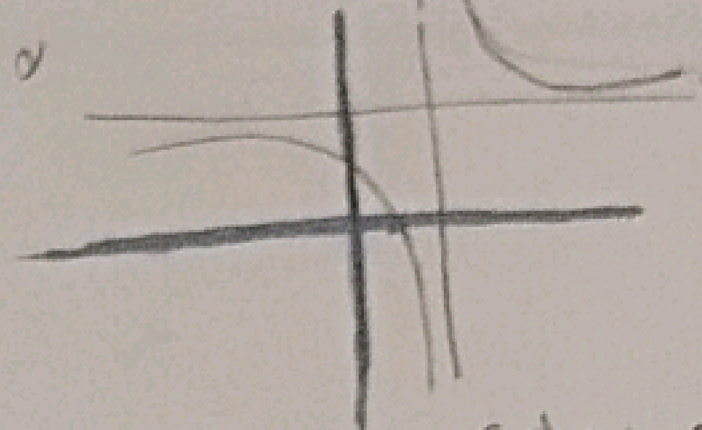
$y=\frac{3x+1}{x-2}$ $\quad y^{-1}=$

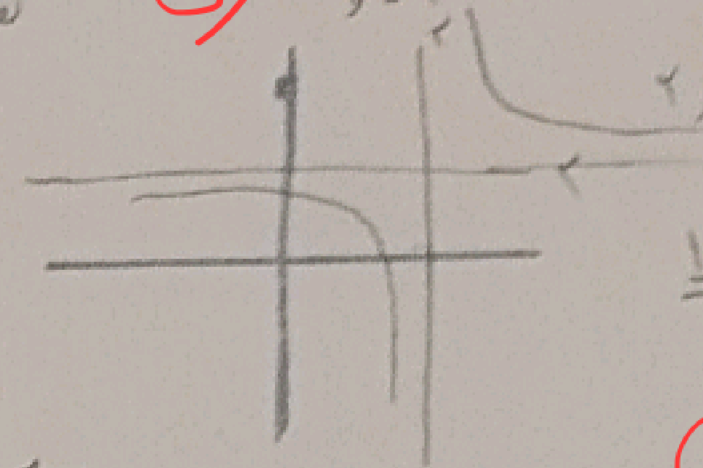
$2, 3 \Rightarrow \frac{31}{8}=3$



خط افقی ۳ ⇒ نقطه را قطع کند

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

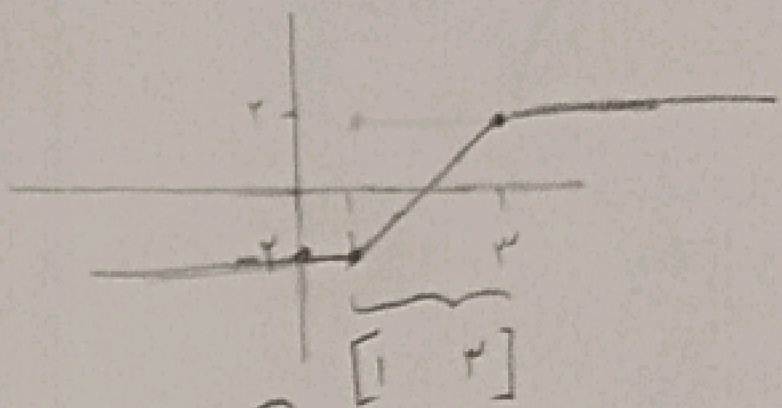
$2, 3$ ب



$\Rightarrow \frac{21}{7}=3$

(د)

$f(x)=|x-1|-|x-3| \quad [a,b], \max f^{-1}(x)=?$

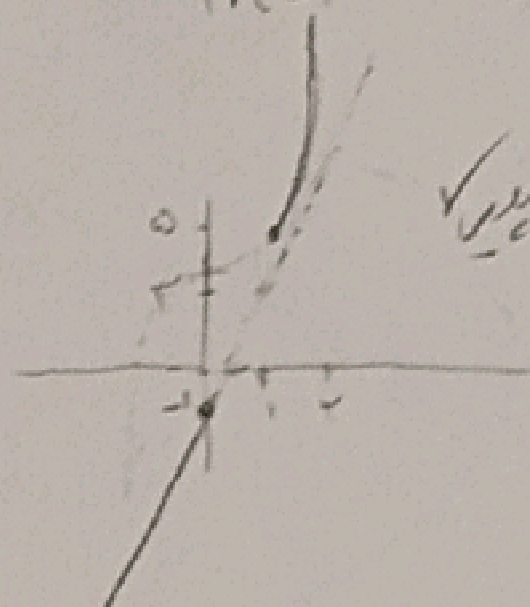


1	3
$x-1$	x
	-2
	$2x-4$

$2x-4 \Rightarrow x=2y-4$

$y=\frac{x+4}{2} \quad -2\le x\le 2$

$[1 \quad 2]$



دامنه برد *

$f(x)=\begin{cases} ①\ x^2+4 & x\ge 1 \\ ②\ 4x-1 & x<0 \end{cases}$

$① \Rightarrow x=y^2+4 \Rightarrow \sqrt{x-4} \quad x\ge 5$

$② \Rightarrow x=4y-1$ (د) $\Rightarrow \frac{x+1}{4} \quad x<0$

$f^{-1}(x)=\begin{cases} \sqrt{x-4} & x\ge 5 \\ \frac{x+1}{4} & x<-1 \end{cases}$

$f(x)=x^2-\frac{(x+1)^3}{x+2} \quad f^{-1}(x)=\frac{ax+b}{2x+d} \quad b<0 \quad f^{-1}(b)=?$

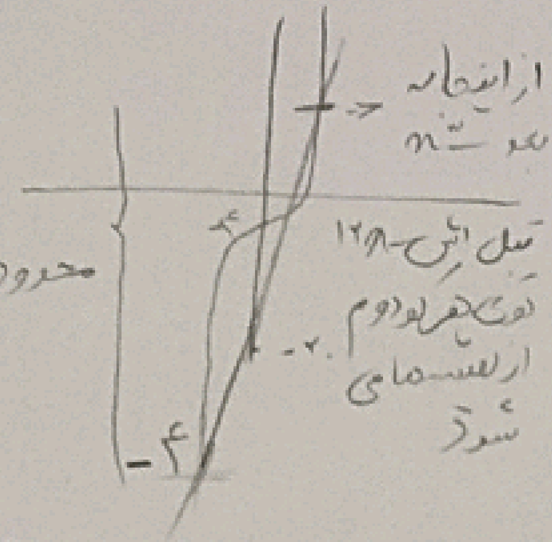
$\frac{x^3+2x^2-x^3-1-3x^2-3x}{x+2} \Rightarrow \frac{-3x-1}{x+3} \Rightarrow x=\frac{-3y-1}{y+3}=-\frac{3x+1}{x+3} \overset{\times 2}{\Rightarrow} \frac{-6x-2}{2x+6}$ (د) $f^{-1}(-2) \Rightarrow \frac{6-1}{-4+6}$

5

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

(د)

$f(x) = \begin{cases} x^3 - 4 & x > a \\ 12x - 20 & x \leq a \end{cases}$



$x^3 - 4 = 12x - 20 \Rightarrow 2 \rightarrow 8 - 4 = 24 - 20$ ✓

$x^3 - 12x + 16 \,|\, x - 2$

$x^2 + 2x - 8$

$(x-2)(x+4)$ → 2, -4

$-4 < a < 2$

$a \in [-4, +\infty)$

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$f(x) = 3x + k$ (-10) $f^{-1}(2) = 4 \Rightarrow 12 + k = 2$

$f(7) = ?\ \ 3(7) - 10 = 11$

$f(f(x)) = ?\ \ 3(3x - 10) - 10 \Rightarrow 9x - 30 - 10 \Rightarrow 9x - 40$

۲

$A(2a, a)$ روی وارون $f(x) = \frac{ax}{x-1} \Rightarrow a = ?$ $f^{-1}(x) \Rightarrow \frac{ay}{y-1} = x \ldots -\frac{-x}{x-a} \Rightarrow \frac{x}{x-a}$

$\frac{2a}{2a-a} = a \Rightarrow a^2 = 2a \Rightarrow a^2 - 2a = 0 \quad a(a-2)$ → 0 تعریف نشده، 2 $\Rightarrow a = 2$

۲

$\{(5,3),(7,4),(2,7),(6,9)\}$

$f = \{(3,5),(4,7),(7,2),(9,6)\}$ $g(x) = \{(3,2),(8,6),(9,5)\}$

$fof^{-1} \Rightarrow 5 \to 3 \to 5,\ 7 \to 4 \to 7$ به همین ترتیب $g^{-1}\ \{(2,3),(6,8),(5,9)\} \rightarrow \{(5,5),(7,7),(2,2),(6,6)\}$

$f^{-1}of \Rightarrow 3 \to 5 \to 3,\ 4 \to 7 \to 4 \ \ldots \Rightarrow \{(3,3),(4,4),(7,7),(9,9)\}$

۲

$g^{-1}of \Rightarrow 3 \to 5 \Rightarrow 9,\ 4 \to 7 \to \times,\ 7 \to 2 \to 3,\ 9 \to 6 \to 8 \Rightarrow \{(3,9),(7,3),(9,8)\}$

$fog^{-1} \Rightarrow 2 \to 3 \to 5,\ 6 \to 8 \to \times,\ 5 \to 9 \to 6 \Rightarrow \{(2,5),(5,6)\}$

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

$1 \to 2 \to 4,\ 3 \to 4 \to 8,\ 5 \to 6 \to 0 \Rightarrow x = \{(1,4),(3,8),(5,0)\}$

۲

$z = \{(1, \frac{2}{4} = \frac{1}{2}), (3, \frac{4}{8} = \frac{1}{2}), (5, \frac{1}{0})\} \Rightarrow$ ۲ عضوی

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نورعلی امامی