Bcp04

چهارم هندسی

۱- ضابطه a را به گونه‌ای تعیین کنید

$f(x)=\begin{cases} x^2-4 & ;x>a \\ 12x-20 & ;x\leq a \end{cases}$ $\quad (a^2-4 \;\; +\infty) \quad (-\infty \;\; 12a-20]$

$a^2-4 \geq 12a-20$

$a^2-12a+12 \geq 0$

	a^2	0	-12	12
2	1	2	-8	0

$(a-2)(a^2+2a-8) = (a-2)^2(a+4)$ $\quad (a-2)(a+4)$

	-4		2	
	$-$	$+$	$+$	$+$

$a=(-4 \;\; +\infty)$

$f(a)=12a+12$ $\quad 12\times 4+K=2$ $\quad f(7)=12\times 7-10=74$

$f^{-1}(2)=4$ $\quad K=-10$

$f(x)=12x-10$

$f(f(x))=12(12x-10)-10$

$144x-120-10=144x-130$

$A(2a,a)$ $\quad f(x)=\frac{ax}{x-1} \Rightarrow f(a)=2a$

$\frac{a^2}{a-1}=2a$ $\quad a^2=2a^2-2a$

$0=a^2-2a$

$a(a-2)$

$a=2$

تابع شبه یک به یک

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

$g^{-1}=\{(3,2),(8,4),(9,5)\}$ $\quad f^{-1}=\{(5,3),(4,5),(7,2),(6,9)\}$

$fof^{-1}=\{(5,5),(7,7),(2,2),(6,6)\}$ $\quad fog^{-1}=\{(3,5),(5,7)\}$

$f^{-1}of=\{(3,2),(4,4),(7,7),(9,9)\}$ $\quad g^{-1}of=\{(3,9),(7,3),(9,8)\}$

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

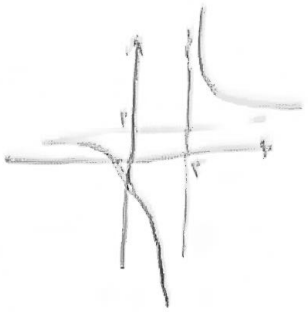
$g^{-1}=\{(1,2),(3,4),(5,6)\}$

$\frac{h}{fog^{-1}}=\{(1,\frac{1}{2}),(3,\frac{1}{2})\}$ $\quad fog^{-1}=\{(1,4),(3,8),(5,0)\}$

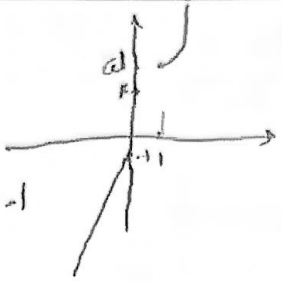
$y = \frac{2x+1}{x-2}$

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

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



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



$x = y^2 + 2$

$x - 2 = y^2$

$\sqrt{x-2} = y \quad ; x \geq 2$

$2x - 1 = y$

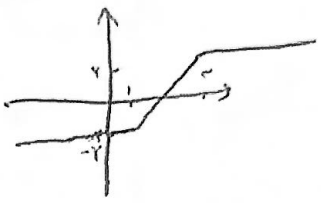
$x + 1 = 2y$

$\frac{x+1}{2} = y$

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

$f(x) = |x-1| - |x-3|$

x	$(-\infty, 1)$	$(1, 3)$	$(3, +\infty)$
$\lvert x-1\rvert - \lvert x-3\rvert$	-2	$2x-4$	2



$[a, b] = [1, 3]$

$f(x) = 2x - 4$

$y = 2x - 4$

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

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

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

$\frac{x^3 + 2x^2 - x^2 - 2x - x - 2 - x^3}{x+2} = \frac{-2x-2}{x+2} = 0$

$f^{-1}(0) = \frac{-2y-1}{y+2} = 0 \Rightarrow y = -\frac{1}{2}$

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

$a = -2$

$b = -2$

$d = 2$

$y = \frac{-2x-1}{x+2} \leftarrow \left(y = \frac{-bx-d}{ax+b}\right)$

$f(x) = \frac{x}{x^2+1}$

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

$xy^2 + x - y = 0$

$xy^2 - y + x = 0$

$y = \frac{1 \pm \sqrt{1 - 4x^2}}{2x}$