1- $y = 1 - \log_c (ax - b)$ $\left|\begin{matrix}0\\2\end{matrix}\right.$ $\left|\begin{matrix}-1.5\\0\end{matrix}\right.$ $b + c = -\frac{3}{2}$

$\rightarrow c > 0 , c \neq 1$ ①

$1 - \log_c^{-b} = 2 \rightarrow \log_c^{-b} = -1 \Rightarrow -b = \frac{1}{c}$

$\rightarrow -\frac{1}{c} + c = -\frac{3}{2} \rightarrow \frac{c^2 - 1}{c} = -\frac{3}{2} \xrightarrow{c \neq 0} 2c^2 - 2 = -3c$

$\rightarrow 2c^2 + 3c - 2 = 0 \rightarrow (c+2)(2c-1) = 0$ < $c = \frac{1}{2}$, $c = -2$ ① $c = \frac{1}{2}$ ✓✓ , $c = -2$ غ ق ق

$\Downarrow$ $b = -2$

$\Rightarrow 1 - \log_{\frac{1}{2}}^{-\frac{3}{2}a + 2} = 0 \rightarrow \log_{\frac{1}{2}}^{-\frac{3}{2}a + 2} = 1 \Rightarrow -\frac{3}{2}a + 2 = \frac{1}{2} \rightarrow a = 1$

$\Rightarrow (a + c) b = \frac{3}{2} \times (-2) = -3$

2- $f(x) = 1 + c \times 3^{a + bx}$ $\left|\begin{matrix}0\\\frac{2}{3}\end{matrix}\right.$ $\left|\begin{matrix}1\\0\end{matrix}\right.$

$f(1) = 0 \rightarrow 1 + c \times 3^{a+b} = 0 \Rightarrow c \times 3^{a+b} = -1 \Rightarrow c = -3^{-a-b}$

$\Rightarrow f(0) = \frac{2}{3} \rightarrow 1 - 3^{-a-b} \times 3^{a} = \frac{2}{3} \Rightarrow 3^{-b} = \frac{1}{3} \Rightarrow b = 1$

$\Rightarrow f(x) = 1 - 3^{-a-1} \times 3^{a+x} = 1 - 3^{x-1} \Rightarrow f(-1) = 1 - 3^{-2} = \frac{8}{9}$

3- $y = c + \log_a (ax + b)$ $\left|\begin{matrix}0\\2\end{matrix}\right.$ $\left|\begin{matrix}\frac{12}{5}\\0\end{matrix}\right.$

$c + \log_a^{b + 2.4a} = 0 \Rightarrow c = -\log_a^{b + \frac{12}{5}a}$

$\Downarrow$

$c + \log_a^b = 2 \rightarrow \log_a^b - \log_a^{b + \frac{12}{5}a} = 2 \rightarrow \log_a \frac{b}{b + \frac{12}{5}a} = 2$

$\Rightarrow \frac{b}{b + \frac{12}{5}a} = 2a \rightarrow b = 2ab + 60a$

$\rightarrow -24b = 60a \rightarrow \frac{a}{b} = \frac{-24}{60} = \frac{-4}{10} = -0.4$

۴- $f(x) = \log_{4}(|x^2-2|-x)$

$|x^2-2|-x>0$

$|x^2-2|>x \left\langle \begin{array}{l} x^2-2-x>0 \rightarrow (x-2)(x+1)>0 \rightarrow \begin{array}{c} -1 \quad 2 \\ \hline + \quad - \quad + \end{array} \quad (1) \\ x^2-2+x<0 \rightarrow (x+2)(x-1)<0 \rightarrow \begin{array}{c} -2 \quad 1 \\ \hline + \quad - \quad + \end{array} \quad (2) \end{array} \right.$

$(1) \rightarrow x \in (-\infty,-1) \cup (2,+\infty)$

$(2) \rightarrow x \in (-2,1)$

$\xrightarrow{\cap} D_f \in$ ~~[crossed out]~~ $\cup \ (-\infty,-1)$

۵- $f(x) = 2+2^{b-ax}$ $\quad g(x) = -x^2-3x+8$

$2+2^{b-a} = -1-3+8 = 4$

$\rightarrow 2^{b-a} = 2 \Rightarrow b-a=1$

$f^{-1}(10) = -1 \rightarrow 2+2^{b+a} = 10 \Rightarrow 2^{b+a} = 2^3 \Rightarrow b+a=3$

$\Rightarrow b=2, a=1 \rightarrow 2b-a = 4-1 = 3$

۶- $f(x) = -2+\left(\frac{1}{2}\right)^{Ax+B}$ $\quad y = x^2-x$

$\rightarrow -2+\left(\frac{1}{2}\right)^{A+B} = 0 \rightarrow 2^{-A-B} = 2^1 \Rightarrow A+B=-1$

$\rightarrow -2+\left(\frac{1}{2}\right)^{2A+B} = 2 \rightarrow 2^{-2A-B} = 2^2 \Rightarrow 2A+B=-2$

$\Downarrow A=-1, B=0$

$\Rightarrow f(3) = -2+\left(\frac{1}{2}\right)^{-3} = 6$

۷- $1h \to \frac{8}{9}x$

① $\log\frac{5}{2} = 2,4 = \log\frac{10}{2} - \log\frac{5}{2} = 2,4 \Rightarrow \log 2 = \frac{10}{48} = \frac{5}{24}$

$\to \log_{\frac{8}{9}}\frac{1}{6} = \log_{72} 6 = \frac{\log 6}{\log 72} \xrightarrow{①,②} \frac{\frac{5}{24}+\frac{5}{14}}{\frac{5}{8}+\frac{5}{7}} = \frac{\frac{43\times 5}{14\times 24}}{\frac{15\times 5}{7\times 8}} = \frac{\frac{1}{...}}{\frac{15}{...}} = \frac{14}{45}$

① $\log\frac{5}{3} = 1,4 \Rightarrow \log\frac{10}{3} = 2,8 \Rightarrow \log 3 = \frac{5}{14}$

$\frac{14}{45} \times \frac{...}{6} = \frac{56}{3}$

۸- $\log_{\frac{7}{8}}\frac{1}{7} = \log_{8\times 7} 7$

① $\log_3 2 = \frac{10}{16}$ ② $\log_3 7 = \frac{10}{6}$

①,② $\Rightarrow \frac{\log_3 2}{\log_3 7} = \log_7 2 = \frac{\frac{10}{16}}{\frac{10}{6}} = \frac{3}{8}$

$\frac{1}{\log_{8\times 7} 7} = \log_7 (8\times 7) = \log_7 8 + \log_7 7 = 3\log_7 2 + 1 = \frac{9}{8} + 1 = \frac{17}{8}$

$\Rightarrow \log_{8\times 7} 7 = \frac{8}{17}$ $\frac{8}{17} \times 7 = \frac{56}{17}$

۹- $\Rightarrow$ ۳٪ → معکوس

$\log_3 2 = \frac{\log 2}{\log 3} = \frac{3}{48} = \frac{1}{16}$

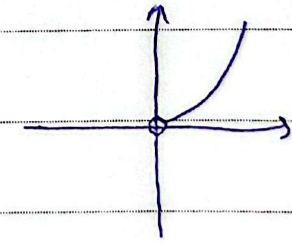
$\log_3 \frac{5}{...} = \log_3 \frac{10}{...} - \log_3 2 = \frac{...}{48} - \frac{1}{16} = \frac{7}{48}$

$\log_{\frac{24}{25}} \frac{1}{3} = \log_{24\times 25} 3 \xrightarrow{\text{معکوس}} \log_3 5^2 + \log_3 3 + \log_3 2^3$

$\hookrightarrow \frac{7}{24} + 1 + \frac{3}{16} = \log_{24\times 25} 3 = \frac{71}{48} \xrightarrow{\text{معکوس}} \frac{48}{71}$

۱۰-

الف) $y = 9^{\log_3 x} \xrightarrow{x>0} y = x^{\log_3 9} = x^2$ →



ب) $y = \log x^2$