نام و نام خانوادگی ...ماهان بابائیان... پاسخنامه تشریحی تکلیف شماره ...۲۵... کلاس ...یازدهم تجربی B...

۱	$y = 1 - \log_c (ax - b)$ $\quad b + c = -\frac{3}{2}$ $\quad (a+c)^b = ?$ $(0,2) \to 1 - \log_c^{-b} = 2 \Rightarrow \log_c^{-b} = -1 \Rightarrow c^{-1} = -b \Rightarrow \frac{1}{c} = -b$ $(-\frac{3}{2}, 0) \to 1 - \log_c (-\frac{3}{2}a - b) = 0 \to \log_c (-\frac{3}{2}a - b) = 1 \Rightarrow c + b = -\frac{3}{2}a \to -2 + \frac{1}{2} = -\frac{3}{2}a \Rightarrow a = 1$ $-\frac{1}{c} + c = \frac{c^2 - 1}{c} = -\frac{3}{2} \to 2c^2 - 2 + 3c = 0 \Rightarrow c = \frac{1}{2} \checkmark \Rightarrow b = -2$; $c = -2$ ✗ $(a+c)^b$: $a = 1,\ b = -2,\ c = \frac{1}{2}$ $\to (1 + \frac{1}{2})^{-2} = \frac{3}{2} \times -2 = -3$
۲	$f(x) = 1 + c \times 3^{a+bx}$ $\quad f(-1) = ?$ $(0, \frac{2}{3})$: $1 + c \times 3^a = \frac{2}{3} \Rightarrow c \times 3^a = -\frac{1}{3} \Rightarrow c \times 3^a = -3^{-1} \Rightarrow c = -1,\ a = -1$ $(1,0) \to 1 + c \times 3^{a+b} = 0 \to c \times 3^{a+b} = -1$ $\underbrace{c \times 3^a}_{-\frac{1}{3}} \times 3^b = -1 \Rightarrow 3^b = -1 \times -3 = 3 \Rightarrow b = 1$ $f(x) = 1 + -3^{-1+x}$ $f(-1) = 1 - 3^{-2}$ $1 - \frac{1}{9} = \frac{8}{9}$
۳	$y = c + \log_5 (ax + b)$ $\quad \frac{a}{b} = ?$ $(0,2) \to y = c + \log_5 b = 2$ $(2.4, 0) \to y = c + \log_5 (2.4a + b) \Rightarrow -c = \log_5 (2.4a + b)$ $\log_5 b - \log_5 (2.4a + b) = 2$ $\log_5 \frac{b}{2.4a + b} = 2 \Rightarrow \frac{b}{2.4a + b} = 25$ $24b = -60a \Rightarrow \frac{a}{b} = \frac{24}{-60} = \boxed{-0.4}$
۴	$f(x) = \log_4 (\lvert x^2 - 2 \rvert - x)$ $\lvert x^2 - 2 \rvert - x > 0$ $\lvert x^2 - 2 \rvert > x \xrightarrow{\text{توان } 2}$ $x^4 + 4 - 4x^2 - x^2 > 0$ $x^4 - 5x^2 + 4 > 0 \xrightarrow{\text{if } x^2 = t} t^2 - 5t + 4 > 0 \to (t-1)(t-4) > 0$ $\quad$ $1,\ 4$: $+\ 0\ -\ 0\ +$ t: $\boxed{D_f = \mathbb{R} - [1,4]}$ $\boxed{D_f = (-\infty, 1) \cup (4, +\infty)}$
۵	$f(x) = 2 + 2^{b - ax}$, $g(x) = -x^2 - 3x + 8 \to (1, ?)$, $f^{-1}(10) = -1$ if $f^{-1}(10) = -1 \Rightarrow f(-1) = 10$ $f(-1) = 2 + 2^{b+a} = 10 \Rightarrow 2^{b+a} = 8 \Rightarrow b + a = 3$ $g(1) = ? \Rightarrow -1 - 3 + 8 = 4 \Rightarrow (1,4)$ $f(1) = 2 + 2^{b-a} = 4 \Rightarrow b - a = 1$ $\begin{cases} b + a = 3 \\ b - a = 1 \end{cases}$ $\quad 2b = 4 \Rightarrow b = 2$ $b + a = 3 \Rightarrow a = 1$ $\quad 2b - a = ?$ $2b - a = 4 - 1 = 3$

$f(x) = -2 + \left(\frac{1}{2}\right)^{Ax+B} \qquad y = x^2 - x \qquad \begin{matrix} x=1 \\ x=2 \end{matrix} \qquad f(3) = ?$ ۶

if $x=1 \Rightarrow y=0$

if $x=2 \Rightarrow y=2$

$-2 + \frac{1}{2}^{A+B} = 0 \Rightarrow 2^{-A-B} = 2 \Rightarrow -A-B=1$

$-2 + \frac{1}{2}^{2A+B} = 2 \Rightarrow 2^{-2A-B} = 2^2 \Rightarrow -2A-B=2$

$-1(+A+B=1)$

$-2A-B=2$

$-A=1 \Rightarrow \boxed{A=-1}$

$1-B=1 \Rightarrow \boxed{B=0}$

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

$f(3) = -2+8 = 6$

$M(t) = x_0 \times \left(\frac{8}{9}\right)^{\frac{t}{60}} \Rightarrow \frac{1}{6}x \Rightarrow \frac{8}{9}^{\left(\frac{t}{60}\right)} = \frac{1}{6}$ ۷

$\log_{\frac{8}{9}} \frac{1}{6} = \frac{t}{60} \Rightarrow \frac{t}{60} = \frac{\log_5 \frac{1}{6}}{\log_5 \frac{8}{9}} = \frac{\cancel{\log_5 1} - \log_5 6}{\log_5 8 - \log_5 9} = \frac{0 - \log_5 2 \times \log_5 3}{3\log_5 2 - 2\log_5 3} = \frac{-\frac{5}{12} - \frac{5}{7}}{3 \times \frac{5}{12} - 2 \times \frac{5}{7}} = \frac{19}{3}$

$\frac{19}{3} \times 60 = \boxed{380\ min}$

$M(t) = x \times \left(\frac{7}{8}\right)^{\frac{t}{7}} = \frac{1}{7}x \Rightarrow \log_{\frac{7}{8}} \frac{1}{7} = \frac{t}{7}$ ۸

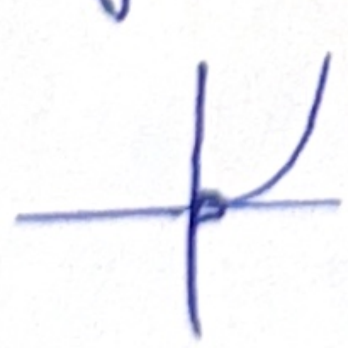
$\frac{t}{7} = \frac{\log_3 \frac{1}{7}}{\log_3 \frac{7}{8}} = \frac{\log_3 1 - \log_3 7}{\log_3 7 - \log_3 8} = \frac{-\frac{5}{3}}{\frac{5}{3} - \frac{15}{8}} = 8 = \frac{t}{7} \Rightarrow t = \boxed{56\ days}$

$M(t) = x \times \left(\frac{96}{100}\right)^t = \frac{1}{3}x \rightarrow \log_{\frac{96}{100}} \frac{1}{3} = t \Rightarrow \frac{\log \frac{1}{3}}{\log \frac{96}{100}} = \frac{-\log 3}{\log 96 - \log 100}$ ۹

$\frac{-\log 3}{5\log 2 + \log 3 - 2} = \frac{-0/48}{1/5 + 0/48 - 2} = \frac{-0/48}{-0/02} = 24$

الف) $y = 9^{\log_3 x}$ ۱۰

$y = x^{\log_3 9} \Rightarrow y = x^2,\ x > 0$



ب) $y = \log x^2$

$y = 2\log_{10} x$