نام و نام خانوادگی [illegible] **پاسخنامه تشریحی تکلیف شماره** ۲(۵) **کلاس** یازدهم [illegible] B

۱

$f(0)=2 \Rightarrow 1-\log_c^{-b}=2 \Rightarrow -b=c^{-1}$

$bc=-1$

$f(-1{,}5)=0 \Rightarrow 1-\log_c^{-1{,}5a-b}=0 \Rightarrow -1{,}5a=\overbrace{b+c}^{-1{,}5} \qquad a=1$

$b+c=-1{,}5$, $bc=-1$ $\Big\}\ x^2+1{,}5x-1=0 \Rightarrow \begin{cases} b=-2 \\ c=\frac{1}{2}\end{cases}$ یا $\begin{cases} b=\frac{1}{2} \\ c=-2\end{cases}$

$(a+c)\,b=b-1=\begin{cases}-3 ✓ \\ -1{,}5 ✓\end{cases}$

۲

$\begin{cases} f(0)=\frac{2}{3} \Rightarrow 1+c\times 3^{a}=\frac{2}{3} \Rightarrow c\times 3^{a}=-\frac{1}{3} \\ f(1)=0 \Rightarrow 1+c\times 3^{a+b}=0 \Rightarrow 1+c\times 3^{a}\times 3^{b}=0 \end{cases}$

$c\times 3^{a}=-\frac{1}{3}$ $\quad 1+\left(-\frac{1}{3}\right)\times 3^{b}=0 \Rightarrow 3^{b}=3 \Rightarrow b=1$

$f(-1)=1+c\times 3^{a-1}=1+\overbrace{c\times 3^{a}}^{-\frac{1}{3}}\times 3^{-1}=1+\left(-\frac{1}{3}\right)\times 3^{-1}=1+\left(-\frac{1}{3}\right)\times\left(\frac{1}{3}\right)=1-\frac{1}{9}$

$=\frac{8}{9}$

۳

$\begin{cases} 2=c+\log_5^{b} \\ 0=c+\log_5^{(2{,}4a+b)} \end{cases} \Rightarrow \log_5^{(2{,}4a+b)}-\log_5^{b}=-2$

$\Rightarrow \log_5^{\frac{2{,}4a+b}{b}}=-2 \Rightarrow \frac{2{,}4a+b}{b}=5^{-2}$

$\Rightarrow \frac{2{,}4a+b}{b}=\frac{1}{25} \Rightarrow \frac{2{,}4a}{b}+1=\frac{1}{25}$

$\frac{24}{10}\times\frac{a}{b}=-\frac{24}{25} \Rightarrow \frac{a}{b}=-\frac{2}{5}$

۴

(1) $x^2-2\geqslant 0 \Rightarrow x^2\geqslant 2 \Rightarrow x\geqslant\sqrt{2}$

$\Rightarrow x^2-2-x>0 \Rightarrow x<-1$ یا $x>2$ $\qquad x\leqslant-\sqrt{2}$ یا $x>2$ (I)

(2) $x^2-2<0 \Rightarrow x^2<2 \Rightarrow -\sqrt{2}<x<\sqrt{2} \Rightarrow -x^2+2-x>0 \Rightarrow -2<x<1$

$\Rightarrow -\sqrt{2}<x<1$ (II)

$D_f=(-\infty,1)\cup(2,+\infty)$

۵

$f(x)=2+2^{b-ax}$

$g(x)=-x^2-3x+8$

$f(1)=g(1)=4=2+2^{b-a} \Rightarrow 2^{b-a}=2 \Rightarrow b-1=1$

$f^{-1}(10)=-1 \Rightarrow 10=f(-1) \Rightarrow 2+2^{b+a}=10 \Rightarrow 2^{b+a}=8 \Rightarrow b+a=3$

$\begin{cases} b-a=1 \\ b+a=3\end{cases} \Rightarrow 2b=4 \Rightarrow b=2 \Rightarrow a=1 \Rightarrow 2b-a=4-1=3$

۶

$y = x^2 - x \xrightarrow{x=1} y = 0 \Rightarrow (A) = (1,0)$

$y = x^2 - x \xrightarrow{x=2} y = 2 \Rightarrow B = (2,2)$

$$\begin{cases} -2 + \left(\frac{1}{2}\right)^{A+B} = 0 \Rightarrow \left(\frac{1}{2}\right)^{A+B} = 2 \Rightarrow A+B = -1 \\ -2 + \left(\frac{1}{2}\right)^{2A+B} = 2 \Rightarrow \left(\frac{1}{2}\right)^{2A+B} = 4 \Rightarrow 2A+B = -2 \end{cases}$$

$\Rightarrow A = -1 \Rightarrow B = 0 \qquad f(x) = -2 + \left(\frac{1}{2}\right)^{-x} \Rightarrow f(3) = -2 + \left(\frac{1}{2}\right)^{-3} = -2 + 8 = 6$

۷

$m(t) = m_0 \left(\frac{8}{9}\right)^{\frac{t}{1}} \Rightarrow \frac{1}{4} m_0 = m_0 \left(\frac{8}{9}\right)^t \Rightarrow \left(\frac{8}{9}\right)^t = \frac{1}{4}$

$\log_5 \left(\frac{8}{9}\right)^t = \log_5 \frac{1}{4} \Rightarrow t \log_5 \left(\frac{8}{9}\right) = -\log_5 4$

$\log_3 5 = 1/4 = \frac{14}{10} = \frac{7}{5} \rightarrow \log_5 3 = \frac{5}{7}$

$t \log_5 \left(\frac{8}{9}\right) = -\log_5 4 \Rightarrow t(\log_5 8 - \log_5 9) = -(\log_5 2 + \log_5 3)$

$\rightarrow t\left(3 \times \frac{5}{14} - 2 \times \frac{5}{7}\right) = -\left(\frac{5}{14} + \frac{5}{7}\right) \Rightarrow t\left(\frac{15-20}{28}\right) = -\left(\frac{35+60}{84}\right) \Rightarrow -5t = -\frac{95}{3} \rightarrow t = \frac{19}{3}$

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

۸

$m(t) = m_0 \left(\frac{7}{8}\right)^{\frac{t}{7}} \Rightarrow \frac{1}{7} m_0 = m_0 \left(\frac{7}{8}\right)^{\frac{t}{7}} \Rightarrow \left(\frac{7}{8}\right)^{\frac{t}{7}} = \frac{1}{7}$

$\log_3 \left(\frac{7}{8}\right)^{\frac{t}{7}} = \log_3 \left(\frac{1}{7}\right) \Rightarrow \frac{t}{7} \log_3 \left(\frac{7}{8}\right) = \log_3 \left(\frac{1}{7}\right) \Rightarrow \frac{t}{7}(\log_3 7 - \log_3 8) = -\log_3 7$

$\log_7 3 = 0/6 = \frac{3}{5} \Rightarrow \log_3 7 = \frac{5}{3} \Rightarrow \frac{t}{7}(\log_3 7 - 3\log_3 2) = -\log_3 7 \Rightarrow$

$\log_2 3 = 1/6 = \frac{8}{5} \Rightarrow \log_3 2 = \frac{5}{8}$

$\frac{t}{7}\left(-\frac{5}{24}\right) = -\frac{5}{3} \Rightarrow \frac{t}{56} = 1 \rightarrow t = 56$

۹

$f(t) = A \left(\frac{96}{100}\right)^t \Rightarrow \frac{A}{3} = A \left(\frac{96}{100}\right)^t \Rightarrow \left(\frac{96}{100}\right)^t = \frac{1}{3}$

$\Rightarrow \log \left(\frac{96}{100}\right)^t = \log \frac{1}{3} \Rightarrow t(\log 96 - \log 100) = -\log 3$

$\longrightarrow t(\log 2^5 + \log 3 - 2) = -\log 3$

$\Rightarrow t(5(0/3)) + 0/48 - 2) = -0/48 \Rightarrow t(1/5 + 0/48 - 2) = -0/48$

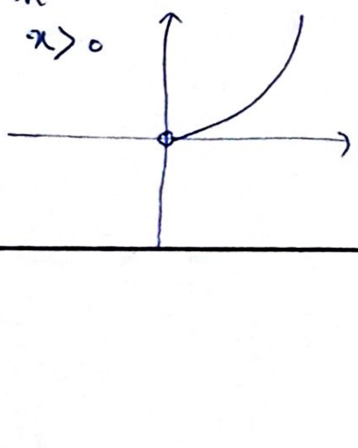
$\Rightarrow -0/02t = -0/48 \rightarrow t = 24$

۱۰

الف) $f(x) = 9^{\log_3 x} = x^{\log_3 9}$

$\Rightarrow x^2$

$x > 0$



ب) $y = \log x^2 \Rightarrow 2\log x \rightarrow x > 0$

$(10) \rightarrow 9 < 10 \checkmark$