۲۰

نام و نام خانوادگی ...امیرمحمد مجتبائی........ پاسخنامه تشریحی تکلیف شماره ..۲۵.. کلاس ...یازدهم ... B......

۱

$y = 1 - \log_c (ax-b)$ $\xrightarrow{x=0,\ y=2}$ $1-\log_c {-b} = 2 \Rightarrow -1 = \log_c -b$

$a=1$, $b=-2$, $c=\frac{1}{2}$; $(a+c)\times b = (1+\frac{1}{2})\times -2 = -\frac{3}{2}\times -2 = \boxed{-3}$

$x=-1.5,\ y=0$; $x=0,\ y=2$ ⇐ با توجه به نمودار

$\begin{cases} b+c=-\frac{3}{2} \\ bc=-1 \end{cases}$; $\frac{1}{c} = -b \Rightarrow -bc = 1 \Rightarrow bc=-1$

$b=-\frac{1}{c}$ $\Rightarrow c - \frac{1}{c} = -\frac{3}{2} \Rightarrow c^2 + \frac{3}{2}c - 1 = 0$

$\boxed{c_1 = \frac{1}{2}}$ ، غ ق ق $c_2=-2$

اگر $\boxed{c = +\frac{1}{2}} \Rightarrow \boxed{b = -2}$ $\xrightarrow{x=-1.5,\ y=0}$ $0 = 1 - \log_{\frac{1}{2}} {-1.5a+2}$

$\frac{1}{2} = -1.5a+2 \Rightarrow -\frac{3}{2} = -\frac{3}{2}a \Rightarrow \boxed{a=1}$

۲

$f(x) = 1 + c \times 3^{ax+bx}$ $\xrightarrow{x=0}$ $\frac{2}{3} = 1 + c\times 3^{a} \Rightarrow c\times 3^{a} = -\frac{1}{3} = c\times 3^{a} = -3^{-1}$

x ; $\Rightarrow x=1,\ y=0$; با توجه به نمودار $y=\frac{2}{3},\ x=0$

$\xrightarrow{x=1}$ $0 = 1 + c\times 3^{a+b} \Rightarrow c\times 3^{a+b} = -1$

3^{a} نمی‌تواند منفی باشد پس $\boxed{c=-1}$

$3^{a} = 3^{-1} \Rightarrow a=-1$

$\xrightarrow[a=-1]{c=-1}$ $-1\times 3^{b-1} = -1$; $3^{b-1} = 1$; $b-1=0$; $b=1$

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

۳

$x=0,\ y=2$; $2 = c + \log_5 b \Rightarrow 2-c = \log_5 b \Rightarrow \boxed{b = 5^{2-c}}$; $\boxed{-\frac{2}{5}}$

$x=2.4,\ y=0$; $0 = c + \log_5 {2.4a+b} \Rightarrow -c = \log_5 {2.4a+b} \Rightarrow 5^{-c} = 2.4a+b$

$\frac{-10\ 5^{-c}}{5^{2-c}} = -10\, 5^{-c-2+c} = -\frac{10}{25}$

$\xrightarrow{b=5^{2-c}}$ $5^{-c} = 2.4a + 5^{2-c} \Rightarrow 5^{-c} - 5^{2-c} = 2.4a$

$\Rightarrow 5^{-c}(1-25) = 2.4a \Rightarrow -24\, 5^{-c} = 2.4a \Rightarrow \boxed{a = -10\, 5^{-c}}$; $\frac{a}{b} = \frac{-10\, 5^{-c}}{5^{2-c}} = \boxed{-10\,\frac{5^{-c}}{5^{2-c}}}$

۴

$f(x) = \log_4 (|x^2-2| - x)$ $\longrightarrow$ $|x^2-2| - x > 0$; فاصله‌بندی ; $x^2=2$ ، $x=\pm\sqrt{2}$

x^2-x-2	$-x^2-x+2$	$x^2-x-2>0$
$(x+1)(x-2)<0$	$-(x+1)(x-2)$	$(x+1)(x-2)>0$

$x<-\sqrt{2}$; ① $x>2$ ، $[-\sqrt{2}, 1)$; ② $x<1$; $-\sqrt{2}<x<\sqrt{2}$ ③ ; $-2<x<1$ ④ ; $x>\sqrt{2}$ ⑤ ; $x>2,\ x<-1$ II ; $\xrightarrow{\cap}$ $x>2$ I

$1\cap 2 = (-\infty, -\sqrt{2}]$

$3\cap 4 = [-\sqrt{2}, 1)$

$4\cap 5 = (2, +\infty)$

$\xrightarrow{\cup}$ $\boxed{(-\infty, 1)\cup(2, +\infty)}$

۵

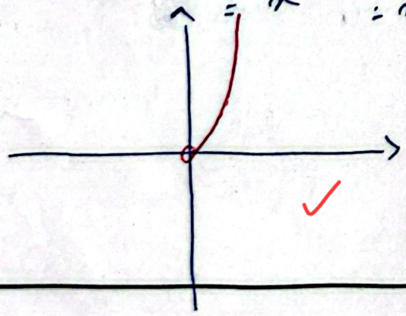
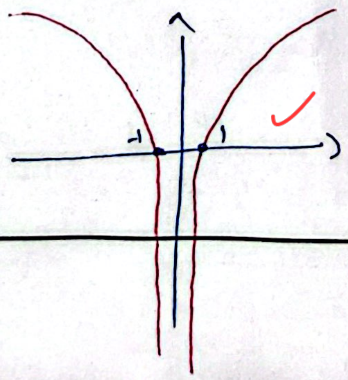
$f(x) = 2 + 2^{b-ax}$; $g(x) = -x^2 - 3x + 8$; $2b-a = \boxed{4-1=3}$

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

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

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

$b+a=3$

$f(x) = -2 + \left(\frac{1}{2}\right)^{Ax+B} \to f(2) = -2 + \left(\frac{1}{2}\right)^{2A+B} = 2 \quad 2^{-2A-B} = 2^2$ $g(x) = x^2 - x \quad - \quad \boxed{f(x) = -2 + \left(\frac{1}{2}\right)^{-x} \quad f(3) = -2 + 8 = 6}$ $\quad -2A-B=2$ $f(1) = g(1) \to g(1) = 1 - 1 = 0 \to f(1) = 0 \to f(1) = -2 + \left(\frac{1}{2}\right)^{A+B} = 0 \to 2^{-A-B} = 2$ $f(2) = g(2) \to g(2) = 4 - 2 = 2 \to f(2) = 2 \quad \begin{cases} -2A-B = 2 \\ -A-B = 1 \end{cases} \Rightarrow \boxed{\begin{matrix} A = -1 \\ B = 0 \end{matrix}} \quad -A-B=1$	۲	۶
$A = A_0 \times a^{\frac{t}{m}}$ $\frac{1}{6}\cancel{A_0} = \cancel{A_0} \times \left(\frac{8}{6}\right)^{\frac{t}{60}}$ $\frac{1}{6} = \left(\frac{8}{6}\right)^{\frac{t}{60}}$ $\log_{\frac{8}{6}} \frac{1}{6} = \frac{t}{60} \to -\log_{\frac{8}{9}} 6 = \frac{t}{60} \Rightarrow \frac{+95}{15} \Rightarrow \frac{+19}{3} = \frac{t}{60} \quad t = \frac{19 \times 60}{3} = \boxed{380 \text{ دفعه}}$ $\to -\frac{\log_5 6}{\log \frac{8}{9}} = \frac{-(\log_5 2 + \log_5 3)}{\log_5 8 - \log_5 9} = \frac{-(\log_5 2 + \log_5 3)}{3\log_5 2 - 2\log_5 3} = \frac{-\log_5 2 - \log_5 3}{3\log_5 2 + 2\log_5 3} = \frac{t}{60}$ $\log_2 5 = 2{,}4 \to \frac{1}{\log_5 2} = 2{,}4 \Rightarrow \log_5 2 = \frac{10}{24} = \frac{5}{12}$ $\log_3 5 = \frac{1}{\log_5 3} = 1{,}4 \Rightarrow \log_5 3 = \frac{10}{14} = \frac{5}{7}$ $\frac{-\frac{5}{12} - \frac{5}{7}}{\frac{5}{4} - \frac{10}{7}} = \frac{\frac{-35-60}{84}}{\frac{35-40}{28}} = \frac{\frac{-95}{84}}{\frac{-5}{28}}$	۲	۷
$A = A_0 \times a^{\frac{t}{m}} \qquad 100 - 12{,}5 = 87{,}5$ $\qquad$ هر روز ۸۷٫۵ درصد می شود $\frac{87{,}5}{100} = \frac{7}{8}$ $\frac{1}{7}\cancel{A_0} = \cancel{A_0} \times \left(\frac{7}{8}\right)^{\frac{t}{7}}$ $\frac{1}{7} = \left(\frac{7}{8}\right)^{\frac{t}{7}} \Rightarrow \log_{\frac{7}{8}} \frac{1}{7} = \frac{t}{7} \to -\log_{\frac{7}{8}} 7 = \frac{t}{7}$ $\to \frac{-1}{\log_7 \frac{7}{8}} = \frac{t}{7} \Rightarrow \frac{-1}{1 - \log_7 8} = \frac{t}{7}$ $\frac{-1}{1 - 3\log_7 2} = \frac{t}{7} \Rightarrow \frac{-1}{1 - 3\frac{\log 2}{\log 7}} = \frac{t}{7}$ $\frac{-1}{1 - 3\frac{1}{\frac{\log_2 3}{\frac{1}{\log_3 7}}}} = \frac{-1}{1 - 3\frac{\log_3 7}{\log_3 2}} = \frac{t}{7}$ $\frac{-1}{1 - 3\frac{0{,}6}{1{,}6}} = \frac{t}{7} \quad \frac{-1}{1 - \frac{9}{8}} = \frac{t}{7} \quad \frac{-1}{-\frac{1}{8}} = \frac{t}{7}$ $\Rightarrow \boxed{8 = \frac{t}{7} \Rightarrow t = 56 \text{ روز}}$	۲	۸
$100 - 4 = 96$ $\qquad$ هر روز غلظت $\frac{96}{100}$ می شود یا $\frac{24}{25}$ $A = A_0 \times a^{\frac{t}{m}} \qquad \frac{t}{1}$ $\frac{1}{3}\cancel{A_0} = \cancel{A_0} \times \frac{24}{25}$ $\log_{\frac{24}{25}} \frac{1}{3} = t \Rightarrow -\log_{\frac{24}{25}} 3 = t \to -\frac{\log 3}{\log \frac{24}{25}} = t = \frac{-0{,}48}{\log 24 - \log 25} = t = \frac{-0{,}48}{\log \frac{300}{100} - \log \frac{100}{4}} = t$ $\frac{-0{,}48}{\log 3 + \log 2^3 - \log 100 + \log 2^2} = \frac{-0{,}48}{0{,}48 + 3\log 2 - 2 + 2\log 2} = \frac{-0{,}48}{0{,}48 + 0{,}9 - 2 + 0{,}6} = \frac{-0{,}48}{9 - 0{,}2} = t$ $\boxed{t = 24}$ در ۲۴ روز	۲	
$y = 9^{\log_3 x} = x^{\log_3 9} = x^{\log_3 3^2} = x^2$ $D_y = x > 0$ 	$y = \log x^2 = 2\log\|x\| \quad x > 0$ $D_y = x^2 > 0 \to x \neq 0$ 	۲ ۱۰