نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

۱

$x=0, y=2 \rightarrow 2 = 1 - \log_c^{-b} \rightarrow 1 = -\log_c^{-b} \rightarrow -1 = \log_c^{-b} \rightarrow \frac{1}{c} = -b$

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

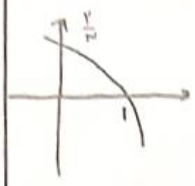
$(b = \frac{1}{2})$ $0 = 1 - \log_{-2}^{-1.5a-1} \rightarrow 1 = \log_{-2}^{-1.5a-0.5} \rightarrow -2 = -1.5a - 0.5$

$-1.5 = -1.5a$

$a = 1$

$(a+c)b \rightarrow (-1)(\frac{1}{2}) = -\frac{1}{2}$

۲



$x=1, y=0 \rightarrow 0 = 1 + c \times 2^{a+b} \rightarrow -1 = c \times 2^a \times 2^b$

$x=0, y=\frac{3}{2} \rightarrow \frac{3}{2} = 1 + c \times 2^a \rightarrow -\frac{1}{2} = c \times 2^a$

$\rightarrow -1 = -\frac{1}{2} \times 2^b \rightarrow 2^b = 2 \rightarrow b = 1$

$f(-1) = 1 + c \times 2^{a+(1\times -1)} = 1 + c \times 2^a \times 2^{-1} = f(-1)$

$f(-1) - 1 = (c \times 2^a) \times 2^{-1} \rightarrow -\frac{1}{2} \times \frac{1}{2} = -\frac{1}{4} \rightarrow f(-1) = 1 - \frac{1}{4} = \frac{3}{4}$

۳

$2 = c \times \log_d^b \quad \begin{cases} 0 = c \times \log_d^{2.4a+b} \rightarrow c = -\log_d^{2.4a+b} \end{cases}$

$\log_d^b - \log_d^{2.4a+b} = 2 - \log_d^5 \rightarrow \frac{b}{2.4a+b} = 25 \rightarrow 50a + 25b = b$

$24b = -50a \rightarrow \frac{a}{b} = \frac{24}{-50} = -0.4$

۴

$f(x) = \log_{\frac{1}{2}}^{(|x^2-2|-x)}$ $|x^2-2|-x > 0 \rightarrow |x^2-2| > x$ $(-\infty, 0) \cup (2, +\infty)$ (II)

$|x^2-2| \geq 0$ $x \in (-\infty, 0]$ (I) $x<0 \rightarrow x^2-2 > x \rightarrow x^2-x-2 = (x+1)(x-2) > 0$

$x^2-2 < -x \rightarrow x^2+x-2 = (x+2)(x-1) < 0$ $(-2, 1)$ (III)

D_f : (I) ∪ (II) ∪ (III) $\Rightarrow (-\infty, 1) \cup (2, +\infty)$

۵

$f(x) = 2 + 2^{b-ax}$, $g(x) = -x^2 - 2x + 1 \rightarrow 2 + 2^{b-a} = -1 - 2 + 1$

$1 = 2^{b-a} \rightarrow b-a = 1$ $f^{-1}(11) = -1 \rightarrow 2 + 2^{b+a} = 10 \rightarrow 2^{b+a} = 8 \rightarrow b+a = 3$

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

$2b - a = 4 - 1 = 3$

۶

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

$x=2 \rightarrow 2 = -2 + \left(\frac{1}{2}\right)^{2A+B} \rightarrow 4 = \left(\frac{1}{2}\right)^{2A+B} \rightarrow 2A+B=-2$

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

$f(3) = -2 + \left(\frac{1}{2}\right)^{-1\times 3+0} = -2 + \left(\frac{1}{2}\right)^{-3} = -2+8 = 6$

۷

جرم اولیه m | چند دقیقه بعد؟ | $\frac{1}{4}m$ | بعد از n ساعت $\left(\frac{1}{9}\right)^n m$

$\left(\frac{1}{9}\right)^n m = \frac{1}{4}m \rightarrow \log_{\frac{1}{9}}^{\frac{1}{4}} = n \rightarrow \frac{-\log_3^4}{\log_3^1 - \log_3^9} = n \Rightarrow \frac{-\log_5^2 - \log_5^3}{3\log_5^2 - 2\log_5^3} = n$

$\log_5^2 = \frac{1}{\log_2^5} = \frac{1}{2,32} = 0,431$

$\log_5^3 = \frac{1}{\log_3^5} = \frac{1}{1,46} = 0,684$

$n = \frac{0,431 - 0,684}{1,293 - 1,368} = 3,37h \xrightarrow{\text{چند دقیقه}} 3,37 \times 60 = 202$ دقیقه

۸

مقدار اولیه m | مقدار باقی مانده بعد از n هفته $\left(\frac{7}{8}\right)^n m$

$\left(\frac{7}{8}\right)^n m = \frac{1}{7}m \rightarrow \log_{\frac{7}{8}}^{\frac{1}{7}} = n \Rightarrow \frac{-\log 7}{\log 7 - \log 8} = \frac{-1,47}{+1,47 - 3(\log 2)} \Rightarrow$

$n = \frac{-1,47}{-0,258} \simeq 1,14$ هفته $\rightarrow 1,14 \times 7 = 7,98$ روز

$\log_3^7 = \frac{1}{\log_7^3} = \frac{1}{0,4} = 1,47$ | $\log_3^2 = \frac{1}{\log_2^3} = \frac{1}{1,4} = 0,625$

۹

غلظت اولیه $\rightarrow 100$ | غلظت روز n ام $\leftarrow 100\left(1-\frac{4}{100}\right)^n$ | $\frac{1}{2}\times 100$ | غلظت خواسته شده $\leftarrow 100\left(\frac{96}{100}\right)^n$

$\frac{1}{2}\times 100 = 100 \times \left(\frac{96}{100}\right)^n \rightarrow \left(\frac{24}{25}\right)^n = \frac{1}{2} \rightarrow \log_{\frac{24}{25}}^{\frac{1}{2}} = n \Rightarrow \frac{-\log 2}{\log 24 - \log 25} \Rightarrow$

$\frac{-\log 2}{3\log 2 + \log 3 - \log 100 + 2\log 2} = \frac{-0,301}{5\log 2 + \log 3 - 2} = 24$

پس از ۲۴ روز

۱۰

الف) $y = 9^{\log_3 x} = x^{\log_3 9} = x^2$

$a > 0$

ب) $y = \log x^2 = 2\log_{10} x$

$2\log x$

$\log x$