نام و نام خانوادگی: ولاء اسدی — تکلیف ۲۵ — یازدهم دفتر C

۱۷

۱) $y = 1 - \log_c^{(ax-b)}$, $b + c = -3/2$ (1)

$\left|\begin{smallmatrix}0\\2\end{smallmatrix}\right. \to 2 = 1 - \log_c^{-b} \Rightarrow \log_c^{-b} = -1 \Rightarrow b = -1/c \xrightarrow{(1)} c - 1/c = -3/2 \to \frac{c^2-1}{c} = -3/2$

$2c^2 - 3c - 2 = 0$

روش $\to c^2 - 3c - 4 = 0 \Rightarrow (c-4)(c+1) = 0$ **۱**

$\to c_1 = 4/2 = 2]$ *

$\to c_2 = -1/2 \to$ با توجه به دامنه غ ق ق

$\xrightarrow{*} b = -1/c = -1/2]$ **

$\xrightarrow{*,**} y = 1 - \log_2^{(ax+1/2)} \quad \left|\begin{smallmatrix}-3/2\\0\end{smallmatrix}\right. \longrightarrow 0 = 1 - \log_2^{(3/2 a + 1/2)}$

$\longrightarrow 2 = 3/2\, a + 1/2 \to 3/2 = 3/2\, a \Rightarrow a = 1]$ ***

درنهایت (***, **, *) : $(a+c)^b = (1+2)^{-1/2} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}]$

۲) $f(x) = 1 + c \times 3^{a+bx}$

$\left|\begin{smallmatrix}0\\2/3\end{smallmatrix}\right. \to f(0) = 1 + c \times 3^a = 2/3 \Rightarrow c \times 3^a = -1/3 \overset{\times 3}{\Rightarrow} c \times 3^{(a+1)} = -1 \Rightarrow c = -3^{(-a-1)}$ (1)

$\xrightarrow{(1)} f(x) = 1 - 3^{(bx-1)}$ (2) **۵**

$\left|\begin{smallmatrix}1\\0\end{smallmatrix}\right. \to f(1) = 1 - 3^{(b-1)} = 0 \Rightarrow 3^{(b-1)} = 0 \Rightarrow b - 1 = 0 \Rightarrow b = 1] \overset{(2)}{\Rightarrow} f(x) = 1 - 3^{x-1}$ (3)

$\overset{(3)}{\Rightarrow} f(-1) = 1 - 3^{-2} = \frac{9}{9} - \frac{1}{9} = \frac{8}{9}]$

۳) $y = c + \log_5^{(ax+b)}$ **۰٫۵**

$\left|\begin{smallmatrix}0\\2\end{smallmatrix}\right. \to 2 = c + \log_5^b \Rightarrow \boxed{b = 5^{(2-c)}}$ * $\Rightarrow y = c + \log_5^{(ax+5^{2-x})}$ (1)

$\left|\begin{smallmatrix}24/10\\0\end{smallmatrix}\right. \xrightarrow{(1)} 0 = c + \log_5^{(\frac{24}{10}a + 5^{2-c})} \longrightarrow 5^{-c} = \frac{24}{10}a + 5^{2-c} \to \frac{24}{10}a = 5^{(2-c)} - 5^{-c}$

$\to \frac{24}{10}a = 5^{2-c}(1 - 25) \Rightarrow 5^{2-c} = -\frac{1}{10}a \to \boxed{a = 5^{2-c} \times -10}$ **

$\xrightarrow{*,**} \frac{a}{b} = \frac{5^{2-c} \times -10}{5^{2-c}} = -10]$

۴) $f(x) = \log_4^{(|x^2-2| - x)}$ **۱٫۵**

مثبت و مخالف یک است

$\xrightarrow{\text{دامنه}} |x^2-2| - x > 0 \Rightarrow |x^2-2| > x$

$\to x^2 - 2 > x \Rightarrow x^2 - x - 2 > 0 \Rightarrow (x-2)(x+1) > 0$

-1		2	
+	-	+	

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

$\to x^2 - 2 < -x \Rightarrow x^2 + x - 2 < 0 \Rightarrow (x+2)(x-1) < 0$

-2		1	
+	-	+	

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

$\xRightarrow{(I \cap II)} D_f = (-2, -1)]$

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

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

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

$\xrightarrow{(1),(2)} \begin{cases} b + a = 3 \\ b - a = 1 \end{cases}$

۵ $\Rightarrow \begin{matrix} b = 2 \\ a = 1 \end{matrix}\ ]$ *

$\xrightarrow{*} 2b - a = 2 \times 2 - 1 = 3]$

6) $x=1 \rightarrow f(1) = -2 + 2^{-A-B}$ ، $y = 1-1 = 0$ $\} \rightarrow 2^{-A-B} = 2 \Rightarrow A+B = -1 \quad (I)$

$x=2 \rightarrow f(2) = -2 + 2^{-2A-B}$ ، $y = 4-2 = 2$ $\} \rightarrow 2^{-2A-B} = 4 \Rightarrow 2A+B = -2 \quad (II)$

$\xrightarrow{(I),(II)} \begin{cases} A+B=-1 \\ 2A+B=-2 \end{cases} \Rightarrow A=-1,\ B=0 \Rightarrow f(x) = -2 + (1/2)^{(-x)} = -2 + 2^x$

$\Rightarrow f(3) = -2 + 8 = 6$]

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7) $m(t) = m_0(1-r)^t \rightarrow \frac{1}{6} m_0 = m_0 (\frac{8}{9})^t \Rightarrow \log_{8/9}^{1/6} = t \rightarrow t = -\log_{8/9}^{6}$

$\log_2^5 = 2.4 \Rightarrow \log_5^2 = \frac{10}{24}$
$\log_3^5 = 1.4 \Rightarrow \log_5^3 = \frac{10}{14}$ $\} \rightarrow t = -\frac{\log_5^6}{\log_5^{8/9}} = -\frac{\log_5^3 + \log_5^2}{\log_5^8 - \log_5^9} = -\frac{\log_5^3 + \log_5^2}{3\log_5^2 - 2\log_5^3}$

$\xrightarrow{\text{جایگذاری}} -\frac{10/24 + 10/14}{\frac{10}{8} - \frac{10}{7}} = \frac{95/84}{\frac{10}{56}} = \frac{532}{84}$ (ساعت)

$\rightarrow \frac{532}{84} \times 60 = 380$ دقیقه]

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8) $12.5\% = \frac{125}{1000} = \frac{1}{8} \rightarrow m(t) = m_0(1-r)^t \Rightarrow \frac{1}{7} m_0 = m_0 (\frac{7}{8})^t$

$\xrightarrow[\log_2]{\text{از طرفین}} \log_2^{1/7} = t \times \log_2^{7/8} \rightarrow -\log_2^7 = t \times (\log_2^7 - 3) \Rightarrow t = \frac{\log_2^7}{3 - \log_2^7} \xrightarrow{*} t = \frac{\frac{8}{3}}{\frac{9}{3} - \frac{8}{3}} = 8$ هفته $\uparrow$ [$8 \times 7 = 56$ روز]

$\xrightarrow{\log_2^7 \text{ ?}} \log_2^3 = \frac{1}{\log_3^2} \Rightarrow \log_3^2 = \frac{1}{1.6}$, $\log_7^3 = \frac{\log_2^3}{\log_2^7} \rightarrow 0.6 = \frac{1.6}{\log_2^7} \Rightarrow \log_2^7 = \frac{16}{6} = \frac{8}{3} \quad (*)$

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9) غلظت : $c \rightarrow c(t) = c_0(1 - \frac{4}{100})^t \rightarrow 1/3 = (\frac{24}{25})^t \rightarrow \log^{1/3} = t \log^{24/25}$

$\rightarrow t = \frac{-\log^3}{\log^{24} - \log^{25}} = \frac{-\log^3}{(\log^3 + 3\log^2) - 2\log^5} = \frac{-0.48}{(0.48 + 0.9) - 2 \times (1 - 0.3)} = \frac{-0.48}{1.38 - 1.4} = \frac{48}{2} = 24$ روز]

$2\log^5 \leftrightarrow 2(1 - \log^2)$ ، $1 - 0.3 = 0.7$

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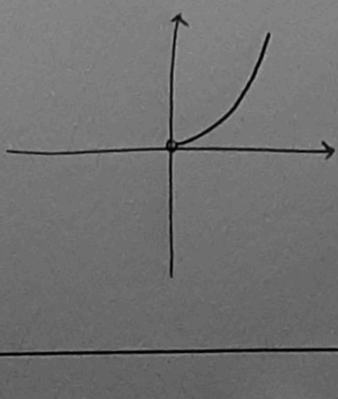
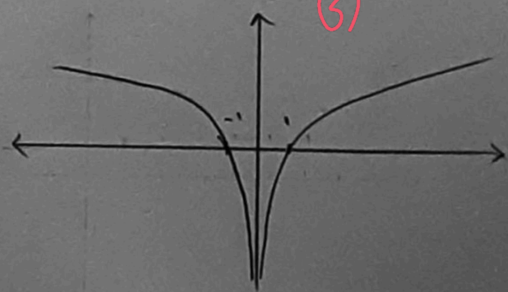
10) الف) $y = x^{\log_3^9} = x^2 \rightarrow y = 9^{\log_3^x} \leftarrow$ دامنه $x > 0$



ب) $y = \log x^2 = 2 \log^x$ (دامنه $\mathbb{R}$)



۱) $x=0 \rightarrow y=1-\log_c^{-b}=2 \rightarrow bc=-1$

$$\begin{cases} b+c=\frac{-3}{2} \\ bc=-1 \end{cases} \rightarrow \begin{cases} b=-2 \checkmark \\ b=\frac{1}{2} \times \end{cases}$$

b نمی‌تواند (+) باشد چون در این صورت c صفر می‌شود

$$x=-1,5=\frac{-3}{2} \rightarrow 1-\log_{\frac{-1}{2}}^{\frac{-3}{2}a+2}=0 \rightarrow a=1 \quad (a+c)b=-3$$

۳) $c+\log_a^{2,5a+b}=0$ ① $\quad c+\log_a^{b}=2$ ②

② − ① $= \log_a^{\frac{b}{2,5a+b}}=2$

$b=4a+2ab \rightarrow \frac{a}{b}=-0,2$