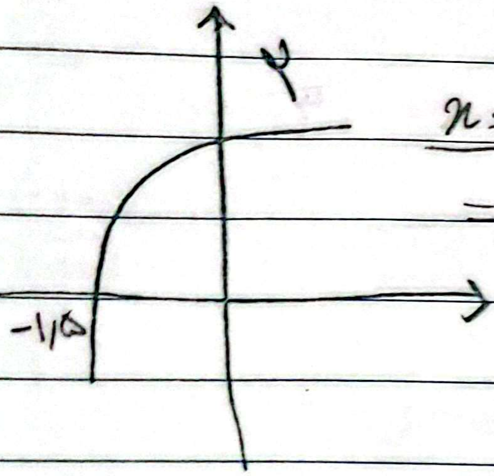
Date ۲۰

یازدهم دختر B آزمایش کریمی

Subject تکلیف ۲۵

(۱)



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

$x=-1/5 \to 1-\log_c^{-1/5a-b}=0$

$\Rightarrow \log_c^{-1/5a-b}=1 \Rightarrow c=-\frac{3a}{2}-b$

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

$x=0 \to 1-\log_c^{-b}=2$

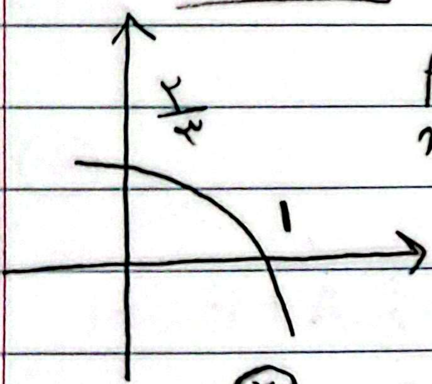
$\log_c^{-b}=-1 \Rightarrow \frac{1}{c}=-b$ (۱)

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

$\Rightarrow 2b^2-2=-3b \to 2b^2+3b-2=0$ $\begin{cases} b=-2 ✓ \\ b=\frac{1}{2} \end{cases}$ غ ق ق

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

(۲)



$f(x)=1+c\times 3^{a+bx}$

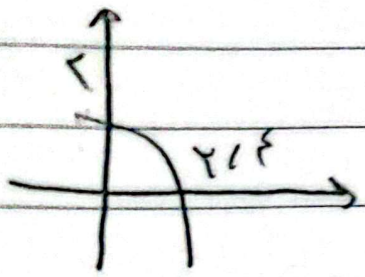
$x=1 \to 1+c\times 3^{a+b}=0$ $c\times 3^{a+b}=-1$ (۱)

$x=0 \to \frac{2}{3}=1+c\times 3^{a} \to c\times 3^{a}=-\frac{1}{3}$ (۲)

$\to \frac{(2)}{(1)} \to \frac{c\times 3^{a}}{c\times 3^{a+b}}=\frac{-\frac{1}{3}}{-1}=\frac{1}{3}$

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

$f(-1)=1+c\times 3^{a-1}=1+c\times 3^{a}\times\frac{1}{3} \to 1+(-\frac{1}{3})\times\frac{1}{3}=\frac{8}{9}$



$y = c + \log_a^{(ax+b)}$ (۳)

$x=0 \Rightarrow 2 = c + \log_a^b \Rightarrow c = 2 - \log_a^b$

$x = 2/4 \Rightarrow c + \log_a^{2/4a+b} = 0 \Rightarrow c = -\log_a^{2/4a+b}$ (۴)

$2 - \log_a^b = \log_a^{2/4a+b} \Rightarrow 2 = \log_a^{\frac{b}{2/4a+b}}$

$\Rightarrow 2a = \frac{b}{2/4a+b} \quad 4a + 2ab = b$

$4a = -24b \Rightarrow \frac{a}{b} = \frac{-24}{4} = \frac{-12}{2}$ (۵)

$f(x) = \log_4^{(|x^2-2|-x)} \rightarrow |x^2-2|-x > 0$

$\begin{cases} x^2-2-x>0 \\ -x^2+2-x>0 \end{cases}$

$x^2-2-x>0$: $+ \;|_{-1}\; - \;|_{2}\; +$ $\rightarrow (-\infty,-1) \cup (2,+\infty)$ (۶)

$-x^2+2-x>0$: $- \;|_{-2}\; + \;|_{1}\; -$ $\rightarrow (-2,1)$

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

$f(x) = 2 + 2^{b-ax} \qquad g(x) = -x^2 - 2x + 1$ (۹)

$x=1 \rightarrow 2 + 2^{b-a} = 6 \Rightarrow 2^{b-a} = 4$ (۷)

$x=-1 \rightarrow 2 + 2^{b+a} = 10 \Rightarrow 2^{b+a} = 8$

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

$2b-a = 2(2)-1 = 3$

$b=2, a=1$

$f(n) = -2 + \left(\frac{1}{2}\right)^{An+B}$ $\quad y = n^2 - n$ (٤)

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

$\Rightarrow A+B = -1$ (٦)

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

$f(\omega) \rightarrow -2 + \left(\frac{1}{2}\right)^{3(-1)} = -2 + 8 = 6$ $\quad A = -1 \; , B = 0$

$P = P_0 \times \left(\frac{8}{9}\right)^t \rightarrow \frac{1}{2} P_0 = P_0 \left(\frac{8}{9}\right)^t \rightarrow \frac{1}{2} = \left(\frac{8}{9}\right)^t$ (٧)

$\rightarrow \log_{\frac{8}{9}} \frac{1}{2} = \log_{\frac{8}{9}} \left(\frac{8}{9}\right)^t \Rightarrow -\log_{\frac{8}{9}} 2 = t \log_{\frac{8}{9}} \frac{8}{9}$

$-(\log_{\frac{8}{9}} 2 + \log_{\frac{8}{9}} 5) = t \left(3 \log_{\frac{8}{9}} 2 - 2 \log_{\frac{8}{9}} 3\right)$

$-\left(\frac{10}{24} + \frac{10}{18}\right) = t \left(3 \times \frac{10}{24} - 2 \times \frac{10}{18}\right)$

$-\left(\frac{5}{12} + \frac{5}{9}\right) = t \left(\frac{5}{4} - \frac{10}{9}\right)$ (٥)

$-\frac{9 \cdot 5}{12 \times 9} = t \left(\frac{3 \cdot 5 - 4 \cdot 5}{4 \times 9}\right)$

$\Rightarrow t = \frac{\frac{-9 \cdot 5}{12 \times 9}}{\frac{-5}{4}} = \frac{11}{\frac{3}{4}} = 240 \text{ min}$

$P = P_0 \times \left(1 - \frac{12.5}{100}\right)^t \rightarrow \frac{1}{9} P_0 = P_0 \times \left(\frac{7}{8}\right)^t \rightarrow \log \frac{1}{9} = \log \left(\frac{7}{8}\right)^t$ (٨)

$\rightarrow t = \frac{\log \frac{1}{9}}{\log \frac{7}{8}} = \frac{\log 1 - \log 9}{\log 7 - 3 \log 2} = \frac{0 - \frac{10}{4}}{\frac{10}{4} - \frac{30}{15}} = 8$ هفته (٩)

$8 \times 7 = 56$ روز

۹) $\left(\frac{۱۰۰-۴}{۱۰۰}\right)^t = \frac{۱}{۳} \rightarrow \left(\frac{۲۶}{۲۵}\right)^t = \frac{۱}{۳} \rightarrow \left(\frac{۲۵}{۲۶}\right)^t = ۳$

$\rightarrow \log\left(\frac{۲۵}{۲۶}\right)^t = \log ۳$

$\rightarrow t\left(\log\frac{۲۵}{۲۶}\right) = \log ۳ \Rightarrow t = \frac{\log ۳}{۲\log ۵ - \log ۲^۶}$

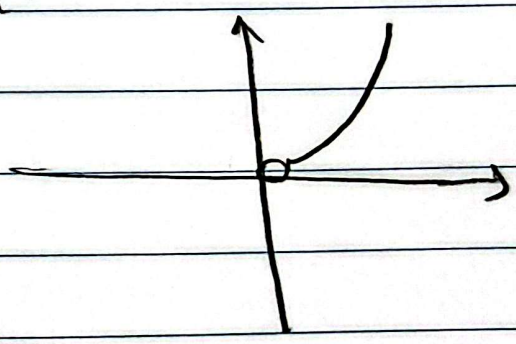
$= \frac{\log ۳}{۲(\log ۱۰ - \log ۲) - (\log ۳ + ۳\log ۲)}$

$= \frac{\log ۳}{۲ - ۰/۳ - ۱/۸} = \frac{\log ۳}{۰/۴۷۱۰} = ۲۴$ دقیقه

۱۰)

الف) $y = \log_{\frac{۱}{۲}} x = \log_{۲^{-۱}} x$

$x > ۰ \leftarrow D = (۰, +\infty)$



ب) $y = \log x^۲ \rightarrow D = \mathbb{R} - \{۰\}$