نام و نام خانوادگی: زهرا سادات حسینی کلین نیا پایه: ۲۵ کلاس: یازدهم ریاضی B

(۱)

$\log_2^5 , \log_5^{0.5} \rightarrow 2 = 1 - \log_c^b \rightarrow \frac{1}{c} = -b \rightarrow b = -\frac{1}{c}$

$0 = 1 - \log_c^{1.5a-b} \rightarrow c = 1.5a - b$ $\Big\}$ $b+c = -\frac{3}{4} \rightarrow -\frac{1}{c} + c = -\frac{3}{4}$

$c^2 + \frac{3}{4}c - 1 = 0 \rightarrow c = \frac{-\frac{3}{4} \pm \sqrt{\frac{25}{16}}}{2} \rightarrow c = \frac{-1.5 + 2.5}{2} = \frac{1}{2} = c$

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

$= -3$

(۲)

$\log_{2.3}^0 \quad \log_0^1 \quad \log_?^{-1}$

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

$f(1) = 1 + c \times 3^a \times 3^b = 0 \rightarrow \underbrace{c \times 3^a}_{-\frac{1}{3}} \times 3^b = -1 \rightarrow 3^b = 3 \rightarrow \boxed{b = 1}$

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

(۳)

$\log_2^0 \quad \log_0^{2.4} \rightarrow \frac{a}{b} = ?$

$2 = c + \log_5^b \rightarrow 5^{2-c} = b \rightarrow 5^{-c} = \frac{b}{25}$

$0 = c + \log_5^{2.4a+b} \rightarrow 5^{-c} = 2.4a + b = \frac{b}{25}$

$\frac{b - 25b}{25} = 2.4a \rightarrow \frac{-24b}{25} = \frac{24}{10}a \rightarrow \boxed{\frac{a}{b} = -\frac{5}{3}}$

(۴)

$|x^2 - 2| - x \geq 0$ $\quad x = -1, 2$

۱) $x^2 - 2 \geq 0 \rightarrow x^2 \geq 2 \rightarrow x \geq \sqrt{2} \cup x \leq -\sqrt{2}$ $\quad x^2 - x - 2 \leq 0 \rightarrow$ (+ | − | +) $\quad D_1 = (-\infty, -\sqrt{2}]$

۲) $x^2 - 2 < 0 \rightarrow x^2 < 2 \rightarrow -\sqrt{2} < x < \sqrt{2}$ $\quad -x^2 - x + 2 \geq 0 \rightarrow$ (− | + | −) $\quad x = -2, 1$ $\quad D_2 = (-\sqrt{2}, 1]$ $\cup (2, +\infty)$

$D = D_1 \cup D_2 = \mathbb{R} - [-\sqrt{2}, 2] - [1, 2]$

(۵) $f(-1)=10 \Leftarrow \begin{cases} 1 \\ 4 \end{cases} \Leftarrow -x^2-2x+8=-1-3+8=4$ ← $g(x)$

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

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

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

(۶) $\begin{cases} 1 \\ 0 \end{cases} \begin{cases} 2 \\ 2 \end{cases} \to f(1)=-2+2^{-A-B}=0 \to -A-B=1$

$f(2) \Rightarrow -2+2^{-2A-B}=2 \to -2A-B=2 \to A=-1, B=0$

$f(x)=-2+2^{x}=6$

(۷) $P=P_0\left(\frac{1}{2}\right)^t \to \frac{1}{4}P_0=P_0\times\left(\frac{1}{2}\right)^t \to \frac{1}{4}=\left(\frac{1}{2}\right)^t$

$\log_a^{\frac{1}{4}}=\log_a^{\left(\frac{1}{2}\right)^t} \to -\log_a^2=t\log_a^{\frac{1}{2}} \to -(\log_a^2+\log_a^3)=t(2\log_a^2-3\log_a^2)$

$-\left(\frac{10}{16}+\frac{10}{24}\right)=t\left(2\times\frac{10}{24}-3\times\frac{10}{16}\right) \to t=\frac{19}{3}=2\text{ ساعت و }40\text{ دقیقه}$

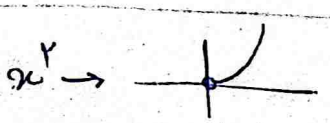
(۸) $P=P_0\left(1-\frac{125}{1000}\right)^t \to \frac{1}{8}P_0=P_0\times\left(\frac{7}{8}\right)^t \to \log_3^{\frac{1}{8}}=10\log_3^{\left(\frac{7}{8}\right)^t}$

$t=\frac{\log_3^{\frac{1}{8}}}{\log_3^{\frac{7}{8}}}=\frac{-\log_3^8}{\log_3^7-\log_3^8}=\frac{-\frac{10}{6}}{\frac{10}{6}-\frac{30}{16}}=8 \text{ هفته} \to 8\times7=56 \text{ روز}$

(۹) $\left(\frac{100-x}{100}\right)^t=\frac{1}{2} \to \left(\frac{24}{25}\right)^t=\frac{1}{2} \sim 2\left(\frac{24}{25}\right)^t=2 \to \log\left(\frac{24}{25}\right)^t=\log 2$

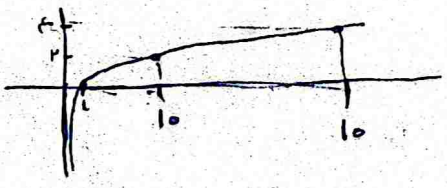
$t\log\frac{24}{25}=\log 2 \to t=\frac{\log 2}{\log 25-\log 24}=\frac{0.301}{2(1-0.3)-(0.301+0.38)}=24$ روز

(۱۰) الف) $x>0 \to x\neq 0 \to x^2 \to$



ب) $2\log_{10}^x$

x	1	10	100
y	0	2	4



مجانب $x=0$