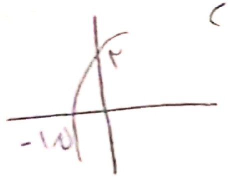
تکلیف ۲۷ ۲۰ لگاریتم سری B امیرمحمد فردبانی

(۲)



$(a+c)b \quad b+c=-\frac{3}{4} \quad y=1-\log_c(ax-b)$

$c>1$

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

$2=1-\log_c^{-b} \to -1=\log_c^{-b} \to \frac{1}{c}=-b$

$c+b=-\frac{3}{4} \to a=1$ ✓

$c+b \to c-\frac{1}{c}=-\frac{3}{4} \to \frac{c^2-1}{c}=-\frac{3}{4} \to 4c^2-4=-3c \to 4c^2+3c-4=0 \to c^2+3c-4=0$

$(c+4)(c-1)=0$

$\frac{1}{2}+b=-\frac{3}{4} \to b=-2$ ✓ $(a+c)b \to (1+\frac{1}{2})^{-2}=$ ($\frac{4}{9}$) ✓

$4-2=\frac{-4}{-4} \quad \frac{1}{2}$ ✓

(۲)

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

$0=1+c\times 3^{a+b} \to -1=c\times 3^{a+b} \quad 3=3^b$

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

($\frac{8}{9}$) ✓ $=1-\frac{1}{9} \quad =1+(-\frac{1}{9})$

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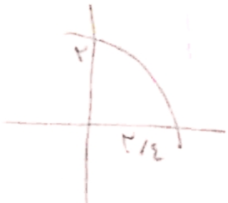

$\frac{a}{b}=?$ $\quad y=c+\log_5(ax+b)$

$\begin{cases} c+\log_5 b=2 \\ c+\log_5(2/4a+b)=0 \end{cases}$

$\log_5(2/4a+b)-\log_5 b=-2 \to \frac{2/4a+b}{b}=5^{-2}=\frac{1}{25} \to \frac{2/4a}{b}+1=\frac{1}{25} \to$ ($\frac{a}{b}=-\frac{2}{5}$) ✓

(۲)

$f(x)=\log_2(|x^2-x|-x) > 0 \to x^2-2-x>0 \to (x-2)(x+1)>0 \to (-\infty,-1)\cup(2,+\infty)$, $(-\infty,-\sqrt{2})\cup(\sqrt{2},+\infty)$

$x^2+x-2<0 \to (-2,1)\cup(-\infty,-\sqrt{2})\cup(\sqrt{2},+\infty)$

I , II ← { (II) $(-\sqrt{2},1)$ ∪ ; (I) $(-\infty,-\sqrt{2})\cup(2,+\infty)$

$(-\infty,-1)\cup(2,+\infty)$ ✓

سوال ۶

(۲)

$f(x)=-2+(\frac{1}{2})^{Ax+B} \quad y=x^2-x \quad (1,0) \ (2,0)$

$0=-2+\frac{1}{2}^{A+B} \to 2=\frac{1}{2}^{A+B} \to 2^1=2^{-A-B} \to -A-B=1$, $A+B=-1 \times -1 \to -A-B=1$

$2=-2+\frac{1}{2}^{2A+B} \to 4=\frac{1}{2}^{2A+B} \to 2^2=2^{-2A-B} \to 2=-2A-B$, $2A+B=-2$

$A=-1 \ , B=0$

بازه: $f(x)=-2+\frac{1}{2}^{-x} \to f(3) \to -2+\frac{1}{2}^{-3} \to -2+2^3 \to -2+8 \to (6)$ ✓

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سوال ۵ — ۲

$f(x)=2+2^{b-ax}$, $g(x)=-x^2+2x+8$ (۱و۰)

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

$2+2^{b+a}=10 \to 2^{b+a}=2^3 \to b+a=3$, $2+2^{b-a}=4 \to 2^1=2^{b-a} \to b-a=1$

$\begin{cases} b+a=3 \\ b-a=1 \end{cases}$ $\Rightarrow b=2,\ a=1$ ✓

$2b-a \to 2(2)-1=3$ ✓

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۷ — ۲

$\frac{1}{4}$, $\frac{1}{2}$, $h=?$, $P=P_0 \times e^{kt}$, $P_2=\frac{8}{9}^{\,t}\cdot P_1 \to \frac{1}{2}P_1=\frac{8}{9}^{\,t}\cdot P_1$

$\log 5=...$, $\log 3=1/4$, $\log 5 = ... = \frac{10}{24}$

$\to \frac{8}{9}^{\,t}=\frac{1}{2}=2^{-1} \xrightarrow{\log} \log_{\frac{8}{9}}\frac{1}{2}=t \to \frac{\log\frac{1}{2}}{\log\frac{8}{9}} \to \frac{\log 2+\log 2}{\log 8-\log 9} = \frac{\frac{10}{14}+\frac{10}{24}}{\frac{30}{14}-\frac{30}{24}} = \frac{\frac{5}{7}+\frac{5}{12}}{\frac{15}{7}-\frac{15}{12}} \to \frac{95}{15}$

$\to \frac{95}{15}\times 10 = 63/85$ ✓

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۸ — ۲

$0/25$, $d=?$, $\frac{1}{7}$, $\log 3=1/6$, $\log 2=0/6$, $P_2=\frac{7}{8}^{\,t}\cdot P_1 \to \frac{1}{7}=\frac{7}{8}^{\,t}$

$\to \log_{\frac{8}{7}}7=t \to \frac{\log 7}{\log\frac{8}{7}} \to \frac{\frac{10}{14}}{\log 8-\log 7} = \frac{\frac{10}{6}}{3\log 2-\frac{10}{6}} \to \dots \to 8\frac{5}{...}\times 7 = 56$ ✓

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۹ — ۲

$m=100\ \text{Lit}$, $td \to 4\ \text{Lit}$, $\frac{1}{3}$, $\log 2=0/3$, $\log 3=0/48$, $M_2=\frac{96}{100}^{\,t}\cdot M_1$

$100-4 \to 96$, $\frac{1}{3}M_1$

$\frac{1}{3}=\left(\frac{96}{100}\right)^t \xrightarrow{\log} \log_{\frac{96}{100}}\frac{1}{3}=3^{-1}=t \to -\log_{\frac{96}{100}}3 \to \frac{1}{-\log_3\frac{96}{100}} \to \log_{\frac{96}{100}}\frac{1}{3} \to \frac{\log_{10}\frac{96}{100}}{\log\frac{1}{3}} \to \frac{\log\frac{100}{96}}{\dots} = 24d$ ✓

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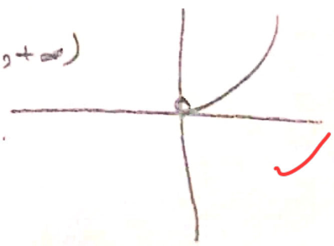
۱۰ — ۲

الف) $y=9^{\log_3 x} \to 3^{2\log_3 x} \to x^2 \xrightarrow{\text{دامنه}} (0,+\infty)$



ب) $y=\log x^2 = 2\log|x|$ دامنه $\mathbb{R}-\{0\}$