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حسابان، تألیف ۲۵، سری یازدهم تجربی A

$y = 1 - \log_c (ax - b)$, $b + c = -3/2$ *

$c > 0$ *

(۱

$(a,2) \to 1 - \log_c^{-b} = 2 \to \log_c^{-b} = -1 \to -\frac{1}{c} = b$

$c = -2$ غ ق ق *

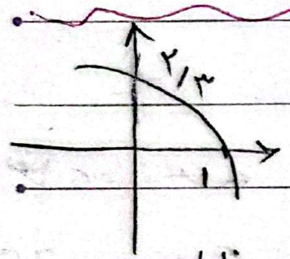
$* \to -\frac{1}{c} + c = -3/2 \to \frac{c^2 - 1}{c} = -3/2 \to 2c^2 + 3c - 2 = 0 \to c = 1/2$

$\Rightarrow b = -2$

$y = 1 + \log_2^{ax+2} \xrightarrow{(-1/5,\, 0)} 1 + \log_2^{-3/2\, a + 2} = 0 \Rightarrow a = 1$

$\to (a + c)b = (1 + 1/2) \times -2 = 3/2 \times -2 = -3$

(۲



$y = 1 + c \times 3^{a + bx}$

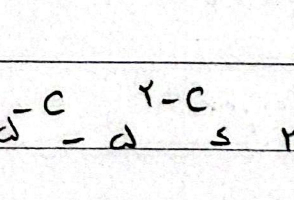
$(0, 2/3) \to 1 + c \times 3^a = 2/3 \to c \times 3^a = -1/3$

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

$b = 1$

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

(۳



$y = c + \log_5^{ax+b}$ $5^{2-c} = b$ *

$(0, 2) \to y = c + \log_5^b = 2 \to 2 - c = \log_5^b$

$(2/4, 0) \to c + \log_5^{2/4a + b} = 0 \to -c = \log_5^{2/4a+b} \to 5^{-c} = 2/4a + b$

$5^{-c} - 5^{2-c} = 2/4a \Rightarrow 5^{-c}(1 - 25) = 2/4a \to a = -10 \times 5^{-c}$ *

$* \frac{a}{b} = \frac{-10 \times 5^{-c}}{25 \times 5^{-c}} = \frac{-2}{5}$

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(۱۵

$x=1 \to -1-\cancel{4}+8 = 2+2^{b-a} \to b-a=1$

$f^{-1}(10)=-1 \to \cancel{X}+2^{a+b}=10 \to b+a=3$ (8 written above 10)

$2b=4 \to b=2$; $2b-a=4-1=3$

$a=1$

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$f(x) = -2+(1/2)^{Ax+B} = -2+2^{-Ax-B}$

$x=1 \to 1 \quad 0/1 = -2+2^{-A-B} \to -A-B=1$

$x=2 \to 2 = -2+2^{-2A-B} \to -2A-B=2$

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

$\to f(x)=-2+2^{x} \to f(3)=-2+8=6$

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$m(t) = \cancel{\phi} \times \left(\frac{8}{9}\right)^{t/40} = 1/4\,\cancel{\phi} \to -\log_{8/9} 1/4 = t/40$

مقدار عنصر

$= -\frac{\log 4}{3\log 2-2\log 3} = t/40 = -\frac{\log 3+\log 2}{3\log 2-2\log 3} = -\frac{\frac{10}{12}+\frac{10}{24}}{1\times\left(\frac{10}{24}\right)-1\times\left(\frac{10}{12}\right)} = \frac{19}{3} = \frac{t}{40} \to$

$t=380$ روز

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$\cancel{\phi} \times \left(\frac{87.5}{100}\right)^{t/7} = 1/8\,\cancel{\phi} \to -\log_{7/8} \cancel{1/8} = t/7 = -\frac{\log 7/3}{\log 7/8} =$

$-\frac{\log 7/3}{\log 7/3 - 3\log 2/3} = \frac{-\frac{10}{6}}{\frac{10}{9}-3\left(\frac{10}{16}\right)} = 8 = \frac{t}{7} \to t=56$ روز

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۹) مقدار ماده خالص روز یک ۱۰۰٪

$100\times(\frac{96}{100})^t = 100\times(\frac{24}{25})^t \Leftarrow$: در n روز

روز دوم: ۹۶٪

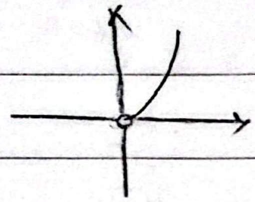
غلظت شده ۳٪ غلظت اولیه: ۱۰۰ و ۳٪

$1/0\times(\frac{24}{25})^t = 0/03\times 100 \to -\log_{24/25} 3 = t = -\frac{\log 3}{3\log 2+\log 3-2\log 5}$

$= -\frac{\log 3}{3\log 2+\log 3-2(1-\log 2)} = -\frac{0/48}{5(0/3)+0/48-2} = \frac{-0/48}{-0/02} = 24$ روز

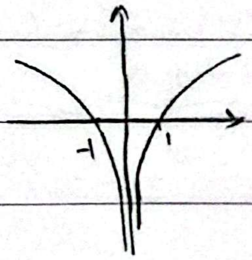
۱۰) الف) $9^{\log_3 x} = x^{\log_3 9} = x^2$

$x>0$



ب) $\log x^2 = 2\log x$

x شرط هم تبدیل می‌کنه



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۱۲) $\log_2(|x^2-2|-x) \to |x^2-2|-x>0$

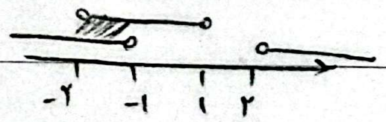
① $x>\sqrt2$, $x<-\sqrt2 \to x^2-x-2>0$

-1		2	
+	-		+

② $x^2-2<0 \to -\sqrt2<x<\sqrt2 \to -x^2-x+2>0$

-2		1	
-	+		-

اشتراک ① و ② $\Rightarrow$



$D_f = (-2,-1)$