تکلیف شماره ۲۵ $\quad$ ۱۹٫۷۵ $\quad$ احمد مارانی

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1. (۲)

$b+c=-\frac{3}{2}$ $\quad x=-1.5 \to y=0 \to 0=1-\log_c^{(-1.5a-b)} \to \log_c^{(1.5-b)}=1$

$c=-1.5a-b$ $\quad x=0 \to y=2 \to 1-\log_c^{-b}=2 \to \log_c^{-b}=-1 \to b=\frac{-1}{c}$ *

$**,* \Rightarrow \begin{cases} b+c=\frac{-3}{2} \\ b=-\frac{1}{c} \end{cases} \quad c-\frac{1}{c}=\frac{-3}{2} \to c=\frac{1}{2}, -2$ (غ‌ق‌ق) (ق‌ق)

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

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2. (۲)

$f(x)=1+c\times 3^{a+bx}$ $\quad x=0 \to f(x)=\frac{2}{3} \to 1+c\times 3^{a+b(0)}=\frac{2}{3} \to 1+c\times 3^a=\frac{2}{3}$

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

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

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

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3. (۳)

$(0,2) \to 2=c+\log_5^{b}$

$(2.4,0) \to 0=c+\log_5^{(2.4a+b)}$ $\quad \Big] \; 2=\log_5^{b/2.4a+b}$

$\log_5^{b/2.4a+b}=2 \to b/2.4a+b=25 \to 60a+25b=b$

$\to 60a=-24b \to \frac{a}{b}=\frac{-24}{60}=\frac{-2}{5}$

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4. (۱)

$|x^2-2|-x>0 \to |x^2-2|>x \to x^2-2>x$, $x^2-2<-x$

$x^2-2-x>0 \to (-\infty,-1)\cup(2,+\infty)$

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

اطهره ارانی

.5 (د)

$f(1)=g(1) \rightarrow ۲+۲^{b-a}=۴ \rightarrow ۲^{b-a}=۲ \rightarrow b-a=1$

$f(-1)=1 \rightarrow ۲+۲^{b+a}=1۰ \rightarrow ۲^{b+a}=۸ \rightarrow b+a=۳$

$۲b-a=۳$ $\quad \hookrightarrow b=۲ ,\ a=1$

.6 (ج)

$f(x)=-۲+\left(\frac{1}{۲}\right)^{Ax+B}$ ، $y=x^{۲}-x$

$x=1 \rightarrow f(x)=y \rightarrow -۲+\left(\frac{1}{۲}\right)^{A+B}=۰ \rightarrow \left(\frac{1}{۲}\right)^{A+B}=۲ \rightarrow A+B=-1$

$\hookrightarrow -A-B=1$

$-A+۲A+۲=1 \rightarrow A=-1$

$\hookrightarrow B=۰$

$x=۲ \rightarrow f(x)=y \rightarrow -۲+\left(\frac{1}{۲}\right)^{۲A+B}=۲ \rightarrow \left(\frac{1}{۲}\right)^{۲A+B}=۴$

$f(x)=-۲+\left(\frac{1}{۲}\right)^{-x} \rightarrow f(۳)=-۲+\left(\frac{1}{۲}\right)^{-۳}=-۲+۸=\boxed{۶}$

.7 (د)

$T=۶۰\ min \qquad A_{۲}=\frac{1}{۶}A_1 \rightarrow A_1\left(\frac{۸}{۹}\right)^{\frac{t}{۶۰}}=\frac{1}{۶}A_1$

$P=\frac{۸}{۹}$ $\qquad \hookrightarrow \log_{۵}\left(\frac{۹}{۸}\right)^{t/۶۰}=\log_{۵}۶$

$\frac{t}{۶۰}\left(\log_{۵}۹-\log_{۵}۸\right)=\log_{۵}۶$ $\qquad t=۳۸۰$

$\hookrightarrow \frac{t}{۶۰}\left(۲\times\frac{۵}{۷}-۳\times\frac{۵}{1۲}\right)=\frac{۵}{1۲}+\frac{۵}{۷} \rightarrow \frac{t}{۶۰}\times\frac{۳}{۷\times1۲}=\frac{1۹}{۷\times1۲}$

۱٫۷۵ .8

$A_{۲} = \frac{1}{۷} A_1$

$A_1 \left(\frac{۷}{۸}\right)^t = \frac{1}{۷} A_1 \longrightarrow ۷^t \times ۷ = ۸^t \times 1 \rightarrow ۷^{t+1} = ۲^{۳t}$

$\log_{۲} ۷^{t+1} = \log_{۲} ۲^{۳t} \longrightarrow (t+1) \log_{۲} ۷ = ۳t \log_{۲} ۲ \rightarrow \frac{۱۰}{۴}(t+1) = \frac{۱۰}{۱۶} \times ۳t$

$\frac{۱۰}{۴} t + \frac{۱۰}{۴} = \frac{۳۰}{۱۶} t \longrightarrow ۱۲t = ۹۶$

$t = ۸$ ~~day~~ هفته

$۷ \times ۸ = ۵۶$ روز

9. $t = 1\ day \quad P = 0/994$ غلظت اولیه × ۹۴ درصد = غلظت آخر

$A_2 = \frac{1}{3}A_1 \rightarrow A_1(0/94)^t = \frac{1}{3}A_1 \longrightarrow \log(\frac{100}{94})^t = \log 3$

$\rightarrow t(\log 100 - \log 94) = \log 3 \longrightarrow t \times 0/02 = 0/48 \rightarrow t = 24$

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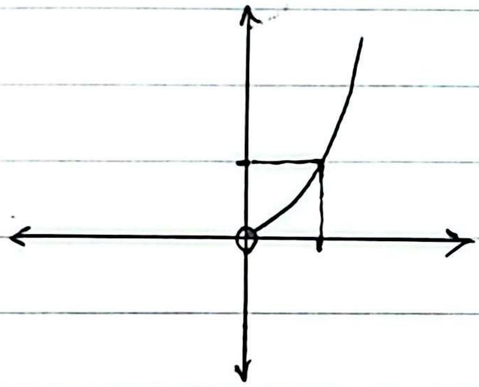
10. الف) $y = 9^{\log_3 x} \xrightarrow{x>0} y = x^{\log_3 9} \rightarrow y = x^2$



$D \in x > 0$

$R \in x > 0$

ب) $y = \log_{10} x^2 \rightarrow 2\log_{10} x$ $D \in x^2 > 0 \rightarrow D \in \mathbb{R} - \{0\}$

$R \in \mathbb{R}$