«باسمه تعالی»

نام و نام خانوادگی: علی ربانی — پاسخنامه تکلیف شماره: ۲۵ — کلاس یازدهم: A

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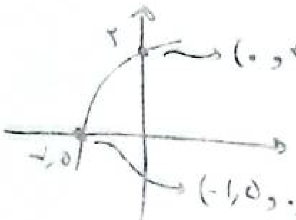
۱- $\boxed{-3}$

$y = 1 - \log_c(ax - b)$



$(0,2) \Rightarrow x=0 \Rightarrow y = 1 - \log_c^{-b} = 2 \qquad -\log_c^{-b} = -1 \Rightarrow c^{-1} = -b$

$\Rightarrow -b = \frac{1}{c} \qquad c + \frac{1}{c} = -\frac{5}{2} \Rightarrow 2c^2 + 5c - 2 = 0 \qquad c^2 + 3c - 4 = 0 \Rightarrow (c+4)(c-1) \qquad \boxed{c = \frac{1}{2}, \cancel{-2}}$

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

$c = \frac{1}{2} \Rightarrow b = -\frac{1}{c} = \boxed{-2}$

$\log_{\frac{1}{2}}^{+2-\frac{3}{2}a} = 1 \Rightarrow -\log_2^{2-\frac{3}{2}a} = 1$

$2^{-1} = 2 - \frac{3}{2}a$

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

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

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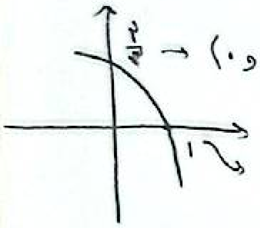
۲- $\boxed{\frac{8}{9}}$



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

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

$f(1) = 1 + c \times 3^{a+b} = 0 \Rightarrow \underline{c \times 3^{a+b}} = -1$

$-\frac{1}{3} \times 3^b = -1 \qquad 3^b = 3 \Rightarrow b = 1$

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

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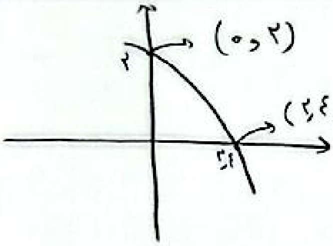
۳- $\boxed{-0.4}$



$y = c + \log_5^{(ax+b)}$

$$\begin{cases} 2 = c + \log_5^b \\ 0 = c + \log_5^{2.4a+b} \end{cases} \Rightarrow 2 = \log_5^b - \log_5^{2.4a+b} \Rightarrow 2 = \frac{\log_5^b}{\log_5^{2.4a+b}}$$

$\Rightarrow \log_5^{\frac{b}{2.4a+b}} = 2 \qquad \frac{b}{2.4a+b} = 25 \Rightarrow 60a + 25b = b$

$60a = -24b \Rightarrow \frac{a}{b} = \frac{-24}{60} = -\frac{4}{10} = \boxed{-0.4}$

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۵- $\boxed{3}$

$\xRightarrow{x=1} \quad -1 - 3 + 8 = 2 + 2^{b-a} \Rightarrow 4 = 2 + 2^{b-a} \qquad 2 = 2^{b-a} \Rightarrow b - a = 1$

$f^{-1}(10) = -1 \Rightarrow f(-1) = 10 \Rightarrow 2 + 2^{b+a} = 10 \Rightarrow 2^{b+a} = 8 \Rightarrow b + a = 3$

$\Downarrow$

$2b = 4 \Rightarrow \boxed{b = 2}, \boxed{a = 1}$

$2b - a = 4 - 1 = \boxed{3}$

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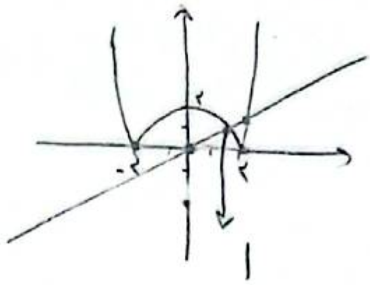
$f(x)=\log_4(|x^2-2|-x) \Rightarrow |x^2-2|-x>0$

$|x^2-2|>x$

$x^2-2>x$ یا $x^2-2<-x$

$\boxed{D_f=[0,1)\cup(2,+\infty)}$



$|x^2-2|=x$ $\quad x\geq 2 \Rightarrow x^2-x-2=0\ (x-2)(x+1)$

$x<2 \Rightarrow x^2+x-2=0\ (x+2)(x-1)$

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۶- $\boxed{6}$

$f(x)=-2+(\frac12)^{Ax+B}$

$y=x^2-x$

$(x=1)\quad -2+(\frac12)^{A+B}=0 \Rightarrow A+B=-1$

$(x=2)\quad -2+(\frac12)^{2A+B}=2 \Rightarrow 2A+B=-2$

$\Rightarrow \boxed{A=-1}\quad \boxed{B=0}$

$f(2)=-2+(\frac12)^{-3}=\boxed{6}$

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$P\times(\frac89)^{6t}=\frac{P}{6}\quad (\frac89)^{6t}=\frac16\quad (\frac98)^{6t}=6\quad 6t\log_6\frac98=\log_6 6 \Rightarrow \log_6\frac98=\frac{1}{6t}$

$\frac{\log_5\frac98}{\log_5 6}=\frac{1}{6t} \Rightarrow \frac{\log_5 9}{\log_5 6}-\frac{\log_5 8}{\log_5 6}=\log_5 9-\cancel{\log_5 6}-\log_5 8+\cancel{\log_5 6}=$

$2\log_5 3-3\log_5 2$

$2\times\frac{10}{14}-3\times\frac{10}{24}=\frac{10}{7}-\frac{10}{8}=\frac{10}{56}$

$\frac{10}{56}=\frac{1}{6t}\Rightarrow \boxed{t=\frac{56}{60}}$

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۸- $\boxed{\frac87}$

$P\times(\frac78)^{7t} \Rightarrow \cancel{P}\times(\frac78)^{7t}=\frac{\cancel{P}}{7}\quad (\frac78)^{7t}=\frac17\Rightarrow(\frac87)^{7t}=7$

$\frac{87.5}{100}=\frac{3.5}{4}=\frac78$

$\cancel{\log_7 7}=7t\log_7\frac87$

$7t\log_7\frac87=1\quad \log_7\frac87=\frac{1}{7t}$

$\frac{\log_5 8}{\log_5 7}=\frac{1}{7t}\Rightarrow \log_7 8-1=\frac{1}{7t}\Rightarrow \log_7 2^3-1=\frac{1}{7t}$

$\frac{3\log_2 2}{\log_2 7}-1=\frac{1}{7t}\quad \frac{3\times\frac{1.}{16}}{\frac{1.}{6}}-1=\frac{1}{7t}$

$\frac{3}{16}\times\frac{6}{1}=\frac98$

$\frac{1}{7t}=\frac98-1=\frac18$

$\frac{1}{7t}=\frac18\quad 7t=8$

$\boxed{t=\frac87}$

۹. $\boxed{\text{۲۴ روز}}$

$P\times\left(\frac{۹۷}{۱۰۰}\right)^t = \frac{P}{۲}$ $\left(\frac{۹۷}{۱۰۰}\right)^t = \frac{۱}{۲}$ $\left(\frac{۱۰۰}{۹۷}\right)^t = ۲$

$\mathrm{Log}_۲^۲ = t\,\mathrm{Log}_۲^{\frac{۱۰۰}{۹۷}} \Rightarrow ۱ = t\left(\mathrm{Log}_۲^{۱۰۰} - \mathrm{Log}_۲^{۹۷}\right)$

$۲\mathrm{Log}_۲^{۱۰} - \mathrm{Log}_۲^{۹۷} = \frac{۱}{t}$

$۲\times\frac{۱۰۰}{\cancel{۲۸}\ ۲۴} = \frac{۱۰۰}{۲۴} - \left(\cancel{\mathrm{Log}_۲^{۳}} + \mathrm{Log}_۲^{۳۲}\right)$

$\frac{۱۰۰}{۲۴} - \frac{\cancel{۳۲}\ ۹۹}{\cancel{۸}\ ۲۴} = \frac{۱}{۲۴}$ $\frac{\mathrm{Log}_{۱۰}^{۲^۵}}{\mathrm{Log}_{۱۰}^{۲}} = ۵\frac{\mathrm{Log}_{۱۰}^{۲}}{\mathrm{Log}_{۱۰}^{۲}}$ $\frac{۳\times۱۰}{۱۰\times\cancel{۲۸}\ ۱۶} = \frac{۱۰}{۱۶} = \frac{۵}{۸} - ۵$

$\frac{۲۵}{۸} + \frac{۸}{۸}$

$\frac{۱}{۲۴} = \frac{۱}{t} \Rightarrow \boxed{t = ۲۴}$

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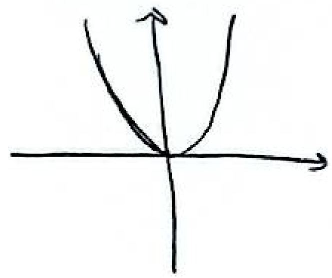
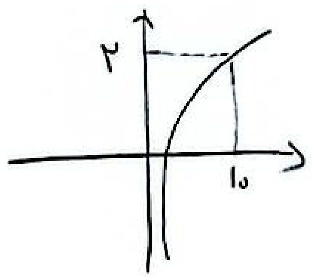
۱۰. الف) $y = ۹^{\mathrm{Log}_۳^x} = x^{\mathrm{Log}_۳^۹} = x^۲$



ب) $y = \mathrm{Log}\,x^۲ = ۲\,\mathrm{Log}\,x$

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