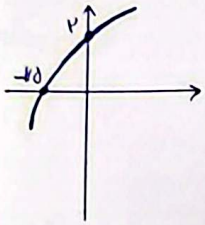
$y = 1 - \log_c^{(ax-b)}$

$b+c = -\frac{۳}{۲}$

$(a+c)b = ?$



① $x=0 \longrightarrow y=2 \Rightarrow 1-\log_c^{-b} = 2 \longrightarrow \log_c^{-b} = -1 \Rightarrow \boxed{\frac{1}{c} = -b}$

$\longrightarrow b+c = -\frac{۳}{۲} \Rightarrow (-\frac{1}{c}) + c = -\frac{۳}{۲} \xrightarrow{\times ۲c} -۲ + ۲c^۲ = -۳c$

$\longrightarrow ۲c^۲ + ۳c - ۲ = 0 \xrightarrow{\text{بسی}} (c-1)(c+۲) = 0$

$c = 1, -۲ \xrightarrow{\div ۲} \boxed{\frac{1}{۲}}, -۲$ غ ق ق

$\Rightarrow b + \frac{1}{۲} = -\frac{۳}{۲} \Rightarrow \boxed{b=-۲}$

$x = -1/۵ \longrightarrow y=0 \Rightarrow 1 - \log_{۲^{-1}}^{-1/۱۵a+۲} = 0 \longrightarrow 1 = \log_{۲^{-1}}^{-1/۱۵a+۲}$

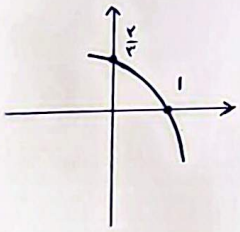
$\Rightarrow -1/۵a + ۲ = \frac{1}{۲}$

$-\frac{۳}{۲}a = -\frac{۳}{۲} \Rightarrow \boxed{a=1}$

$\Rightarrow (a+c)b = (1+\frac{1}{۲}) - ۲ = \boxed{-۳}$

$f(x) = 1 + c \times ۲^{a+bx}$

$f(-1) = ?$



② $x=0 \longrightarrow y = \frac{۲}{۳} \Rightarrow 1 + c \times ۲^{a} = \frac{۲}{۳} \Rightarrow \boxed{c \times ۲^{a} = -\frac{1}{۳}}$

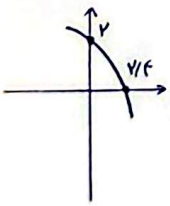
$x=1 \longrightarrow y=0 \Rightarrow 1 + c \times ۲^{a+b} = 0 \Rightarrow 1 + (\underbrace{c \times ۲^{a}}_{-\frac{1}{۳}} \times ۲^{b}) = 0$

$\Rightarrow -(۳^{-1+b}) = -1 \Rightarrow -1 + b = 0 \Rightarrow \boxed{b=1}$

$x=-1 \Rightarrow 1 + c \times ۲^{a-1} \longrightarrow 1 + \underbrace{c \times ۲^{a}}_{-\frac{1}{۳}} \times ۲^{-1} \longrightarrow 1 - \frac{1}{۹} = \boxed{\frac{۸}{۹}}$

$y = c + \log_۵^{(ax+b)}$

$\frac{a}{c} = ?$



③ $x=0 \longrightarrow y=2 \Rightarrow c + \log_۵^{b} = 2 \longrightarrow c - ۲ + \log_۵^{b} = 0$

$x = ۲/۴ \longrightarrow y=0 \Rightarrow c + \log_۵^{۲/۴a+b} = 0$

$\Rightarrow c + \log_۵^{۲/۴a+b} = c - ۲ + \log_۵^{b} \Rightarrow \log_۵^{۲/۴a+b} = \log_۵^{b} - \log_۵^{۲۵}$

$\Rightarrow ۲/۴a + b = \frac{b}{۲۵} \longrightarrow ۶۰a + ۲۵b = b \longrightarrow ۶۰a = -۲۴b$

$\boxed{\frac{a}{b} = \frac{-۲۴}{۶۰} = -\frac{۲}{۵} = -\frac{۴}{۱۰}}$

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۴) $f(x)=\log_{\frac{1}{4}}^{(|x^2-2|-x)}$ $\Rightarrow |x^2-2|-x>0 \Rightarrow |x^2-2|>x \longrightarrow$ (I) $x^2-2>x$ ، (II) $-x^2+2>x$

$D_f=?$

(I): $x^2-x-2>0 \longrightarrow (x-2)(x+1)>0 \Rightarrow x\in(-\infty,-1)\cup(2,+\infty)$

(II): $x^2+x-2<0 \longrightarrow (x-1)(x+2)<0 \Rightarrow x\in(-2,1)$

D_f: (I) ∩ (II) $=(-\infty,1)\cup(2,+\infty)=\mathbb{R}-[1,2]$

۵) $f(x)=2+2^{b-ax}$, $g(x)=-x^2-2x+8$, $x_{\text{تلاقی}}=1$

$\xrightarrow{x=1} 2+2^{b-a}=-1-2+8 \Rightarrow 2^{b-a}=2 \Rightarrow b-a=1$

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

$b=2$، $a=1$

$2b-a=?$ $\Rightarrow 2(2)-(1)=3$

۶) $f(x)=-2+(\frac{1}{2})^{Ax+B}$, $y=x^2-x$, $x_{\text{تلاقی}}=2,1$

$\Rightarrow \begin{cases} x=2 \longrightarrow 2=-2+(\frac{1}{2})^{2A+B} \Rightarrow 2^2=2^{-2A-B} \Rightarrow -2A-B=2 \\ x=1 \longrightarrow 0=-2+(\frac{1}{2})^{A+B} \Rightarrow 2^1=2^{-A-B} \Rightarrow -A-B=1 \end{cases}$

$A=-1$، $B=0$

$f(2)=?\longrightarrow -2+(\frac{1}{2})^{2(-1)+0}=-2+2^3=6$

۷) $P=P_0e^{kt} \Rightarrow \frac{1}{4}=1\times(\frac{8}{9})^t \Rightarrow \log_{\frac{8}{9}}^{\frac{1}{4}}=t \Rightarrow \frac{\log_5^{\frac{1}{4}}}{\log_5^{\frac{8}{9}}}=t$

$\Rightarrow \frac{\log_5^{2^{-2}}+\log_5^{2^3}}{\log_5^{3^2}-\log_5^{2^3}}=t \Rightarrow \frac{-\frac{2}{12}-\frac{3}{7}}{\frac{3}{4}-\frac{10}{7}}=\frac{\frac{-28-40}{84}}{\frac{28-40}{28}}=\frac{-\frac{68}{84}}{-\frac{12}{28}}=\frac{17}{3}$

$\log_2^5=\frac{1}{\log_5^2}=\frac{24}{10}=\log_5^{2^3}=\frac{3}{12}$

$\log_3^5=\frac{1}{\log_5^3}=\frac{14}{10}=\log_5^{3^2}=\frac{7}{10}$

$\Rightarrow \frac{19}{3}=t$ ساعت $\xrightarrow{1t=1h=60min} \frac{19}{3}\times 60=380\ min$

۸)

$\%12/5 = \frac{1}{8} \Rightarrow P = P_0 e^{Kt} \Rightarrow \frac{1}{7} = 1 \times \left(\frac{7}{8}\right)^t \Rightarrow \log_{\frac{7}{8}} \frac{1}{7} = t$

$\Rightarrow \frac{\log_3 \frac{1}{7}}{\log_3 \frac{7}{8}} = t \Rightarrow \frac{\log_3 1 - \log_3 7}{\log_3 7 - \log_3 2^3} = \frac{0 - \frac{5}{3}}{\frac{5}{3} - \frac{15}{8}} = \frac{-\frac{5}{3}}{\frac{40-45}{24}} = t$

$\log_2 3 = \frac{1}{\log_3 2} = \frac{16}{10} \Rightarrow \boxed{\log_3 2 = \frac{5}{8}}$

$\log_7 3 = \frac{1}{\log_3 7} = \frac{6}{10} \Rightarrow \boxed{\log_3 7 = \frac{5}{3}}$

$\Rightarrow t = 8$ هفته $\xrightarrow{\text{۱ هفته = ۷ روز}} 8 \times 7 = \boxed{56}$ روز

۹)

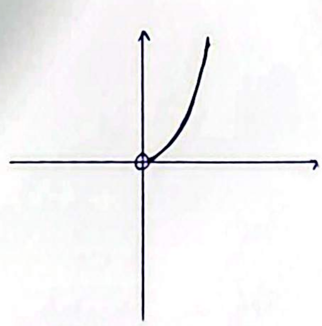
$P = P_0 e^{Kt} \Rightarrow \frac{1}{3} = 1 \times \left(\frac{24}{25}\right)^t \Rightarrow \log_{\frac{24}{25}} \frac{1}{3} = t$

$\Rightarrow \frac{-\log 3}{\log \frac{24}{25}} = \frac{-\log 3}{\log 24 - \log 25} = \frac{-\log 3}{(3\log 2 + \log 3) - (\log 100 - 2\log 2)}$ ($\log 3 = 0/48$، $3\log 2 = 0/9$، $\log 100 = 2$، $2\log 2 = 0/6$) $= t \Rightarrow \frac{-0/48}{1/38 - 1/40} = \frac{-0/48}{-\frac{2}{100}} = \boxed{24}$

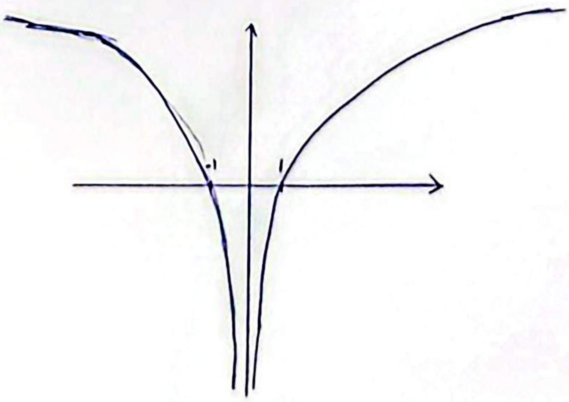
$\Rightarrow \boxed{t = 24}$ روز

۱۰)

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



ب) $y = \log x^2 \xrightarrow[\text{همواره مثبت است}]{x^2} 2\log|x|$



به امید آزادی، مراقب خودتون باشید!