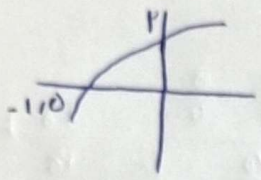


$y = 1 - \log_c^{ax-b}$

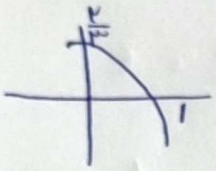
$b+c = \frac{-3}{2}$ → $\begin{array}{|c|c|}\hline 0 & -\frac{3}{2} \\ 2 & \\ \hline \end{array}$

$2 = 1 + \log_c^{-b}$ → $b = \frac{-1}{c}$ $\quad c - \frac{1}{c} = \frac{-3}{2}$ → $c = \begin{cases} \frac{1}{2} \\ -2 \text{ غ ق ق} \end{cases}$ → $0 < c < 1$

$c = \frac{1}{2}$, $b = -2$

$0 = 1 - \log_c^{\frac{-3a}{2}} - b$ → $c+b = \frac{-3}{2}$ → $a = 1$

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



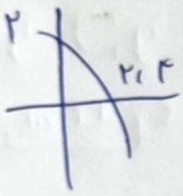
$f(x) = 1 + c \times 2^{a+bx}$ $\quad \begin{array}{|c|c|}\hline 1 & \\ 0 & \frac{1}{2} \\ \hline \end{array}$

$0 = 1 + c \times 2^{a+b}$ → $2^{a+b} = \frac{-1}{c}$ → $\log_2^{-c^{-1}} = a+b$ → $\frac{1}{-c} > 0$

$\frac{1}{2} = 1 + c \times 3^{a}$ → $-2^{-1} = c \times 2^{a}$ → $c = -1$, $a = -1$ → $b+a = 0$

$b = 1$

$f(-1) = 1 + -1 \times 2^{-1-1} = 1 - 2^{-2} = 1 - \frac{1}{9} = \boxed{\frac{8}{9}}$



$y = c + \log_a^{ax+b}$ $\quad \begin{array}{|c|c|}\hline 2,4 & \\ 0 & 2 \\ \hline \end{array}$ → $-c = \log_a^{2,4a+b}$ → $a = -0,1\,a$

$2 = c + \log_a^{b}$ → $a^{-c} = \frac{b}{25}$

$\frac{b}{25} = \frac{-1\,a}{10}$ → $\frac{a}{b} = \frac{-10}{25} = -0,4$

$f(a) = \log_4^{|a^2-2|-a}$ → $|a^2-2| - a > 0$ → $|a^2-2| > a$ → $a^2 - 2 > a$

① $(a-2)(a+1) > 0$ $\quad \begin{array}{|c|c|c|}\hline -1 & & 2 \\ + & - & + \\ \hline \end{array}$

② $(a+2)(a-1) < 0$ $\quad \begin{array}{|c|c|c|}\hline -2 & & 1 \\ + & - & + \\ \hline \end{array}$

① ∪ ② = $D_f = (-\infty, 1) \cup (2, \infty)$

$f(a) = 2 + 2^{b-aa}$ $\quad g(a) = a^2 - 3a + 8$ $\quad a = 1$ $\quad f^{-1}(1) = 1$

$g(1) = f(1)$ → $4 = 2 + 2^{b-a}$ → $2^{b-a} = 2$ → $b - a = 1$

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

$\Rightarrow b = 2$, $a = 1$

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

$f(1) = g(1)$ → $0 = -2 + 2^{-A-B}$ → $-A - B = 1$ $\quad f(2) = g(2)$ → $2 = -2 + 2^{-2A-B}$ → $2A + B = -2$

$\Rightarrow A = -1$, $B = 0$ $\quad f(x) = -2 + 2^{x}$, $f(3) = \boxed{6}$

-۷

$\lg_2^5 \approx 2{,}4 \quad \lg_2^3 \approx 1{,}6$

t ساعت $\Rightarrow \frac{M}{4}$ ، $M\left(\frac{1}{4}\right)^t \rightarrow \lg_{\frac{1}{4}}^{\frac{1}{8}}$ ، $\epsilon \rightarrow$ (۷)

M اولیه

$t = -\lg_{\frac{1}{8}}^{4}$ تغییر مبنا $\rightarrow \frac{\lg_5^4}{\lg_5^{\frac{1}{8}}} = \frac{\lg_5^2 + \lg_5^2}{\lg_5^3 - \lg_5^4}$ ، $\frac{\frac{2}{12} + \frac{2}{7}}{2\lg_5^2 - 2\lg_5^3}$ ، $-\frac{\frac{2}{12} + \frac{2}{7}}{\frac{12}{12} - \frac{10}{7}} = -\frac{-96}{-12} = h$

$\frac{19}{3} h \times 60\,\text{min} = 380\,\text{min}$

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$\lg_2^3 \approx 1{,}6 \quad \lg_7^3 \approx 0{,}4$

t هفته $\Rightarrow \frac{M}{7}$ ، $M\left(\frac{7}{8}\right)^t \rightarrow \lg_{\frac{7}{8}}^{\frac{1}{7}} = \epsilon$ (۴)

M اولیه

$-\lg_{\frac{7}{8}}^{7} = t \rightarrow t$ تغییر مبنا $\frac{-\lg_3^7}{\lg_3^{\frac{7}{8}}} = \frac{-\lg_3^7}{\lg_3^7 - 3\lg_3^2}$ ، $\frac{\frac{10}{4}}{\frac{10}{4} - \frac{10}{7}} =$ هفته ۸

روز ۵۶ ، ۸۴

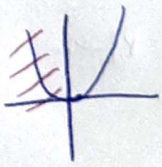
-۹

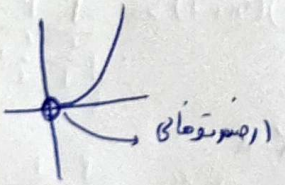
$\lg 2 \approx 0{,}3 \quad \lg 3 \approx 0{,}48 \quad \frac{100}{100}\left(\frac{24}{25}\right)^t = \frac{1}{2} \times \frac{100}{100} \rightarrow$ دستگاه $\frac{24}{25}$ خواهد شد

$\left(\frac{24}{100}\right)^t = \frac{1}{2} \rightarrow (\epsilon) \lg_{\frac{24}{100}}^{\frac{1}{2}} \rightarrow (\epsilon) \lg 2 - \lg 100 - \lg 24 \rightarrow (\epsilon) \lg 2 - 2\lg 10 - \lg 3$

$(\epsilon) (3\lg 2 + \lg 3 - 2) \rightarrow (\epsilon) (1{,}5 + 0{,}48 - 2) = -0{,}48 \rightarrow t = 24$ روز

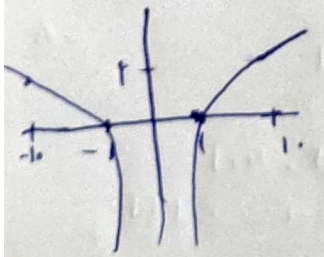
-۱۰

الف) $2{,}9 \lg_3^m$ تغییر مبنا $\rightarrow m \lg_3^9$ ، $m^2 \rightarrow m > 0 \rightarrow$  $\Rightarrow$ (۵)



$\rightarrow$ ط.ت

ب) $2 \leq \lg_m^2 \rightarrow m \in (1, 10] - \{0, 1\} \rightarrow$ چون $m > 0$ $\quad 2 = 0 \rightarrow m = 1$



$\rightarrow$ ط.ت