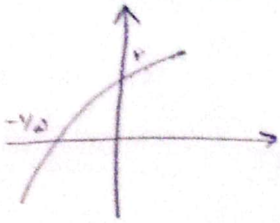
ریاضی پایه

مقطع: یازدهم دفتر A

①



$y = 1 - \log_c^{(ax-b)}$ $\boxed{b + c = -\frac{3}{2}}$ *

$f(0) = 2 \rightarrow 1 - \log_c^{-b} = 2 \Rightarrow \log_c^{(-b)} = -1 \quad -b = \frac{1}{c} \rightarrow \boxed{bc = -1}$ *

$f(-1/5) = 1 - \log_c^{(-1/5a - b)} = \ldots \rightarrow \log_c^{-1/5a-b} = 1 \rightarrow b + c = -1/5a \rightarrow \boxed{a = 1}$

$* \rightarrow x^2 - Sx + P \rightarrow x^2 + 1/5x - 1 = 0 \begin{cases} x = -2 \\ x_1 = \frac{1}{2} \end{cases}$

$(a+c)b \Rightarrow (1+0/5)(-2) = \boxed{-3}$

مبنای log نمی‌تواند منفی باشد $\leftarrow c = \frac{1}{2}$ ، $b = -2$

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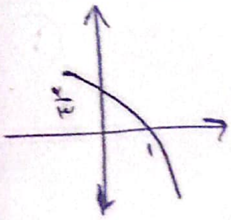
②



$f(x) = 1 + c \times 3^{a+bx}$ $\quad f(-1) = 1 - 3^{+x-1} \rightarrow 1 - 3^{-2} = \boxed{\frac{8}{9}}$

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

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

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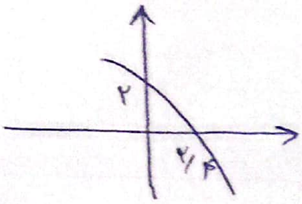
③



$y = c + \log_5^{(ax+b)}$ $\quad \frac{-b}{25} = \frac{a}{10} \rightarrow \boxed{\frac{a}{b} = -\frac{10}{25}}$

$f(2/4) = 0 = c + \log_5^{2/4a+b} \rightarrow \frac{b}{25} = 2/4a + b \rightarrow \frac{b}{25} = \frac{24}{10}a + b$

$-\frac{24b}{25} = \frac{24}{10}a$

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

$5^2 \times 5^{-c} = b$

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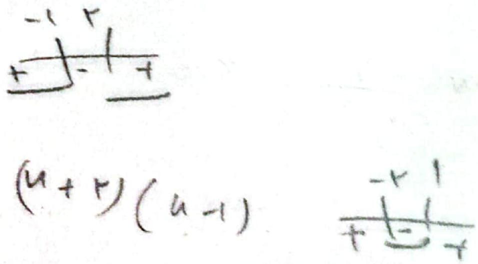
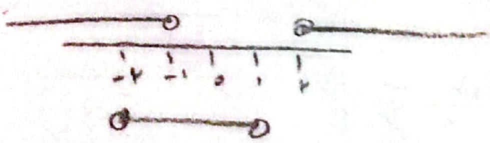
④

$f(x) = \log_4^{(|x^2-2| - x)}$ $\quad |x^2-2| - x > 0 \rightarrow |x^2-2| > x$

① $x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) > 0$

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





$\mathbb{R} - [1, 2]$

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(۵)

$f(x) = 2 + 2^{b-ax}$, $f(-1) = 10 \rightarrow f = 2 + 2^{b-a} \rightarrow \boxed{b-a=1}$, $b=2$

$g(x) = -x^2 - 3x + 8 \xrightarrow{x=1} -1-3+8 \Rightarrow (4)$ $(1,4)$ $\quad 10 = 2 + 2^{b+a} \rightarrow \boxed{b+a=3}$, $a=1$

$2b - a = (3)$

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(۶)

$f(x) = -2 + (\frac{1}{2})^{Ax+b} \rightarrow (1,0) \rightarrow 0 = -2 + (\frac{1}{2})^{A+b} \rightarrow A+b = -1$ $\quad b = 0 \Rightarrow A = -1$

$y = x^2 - x \begin{cases} x=1 \Rightarrow y=0 \\ x=2 \Rightarrow y=2 \end{cases}$ $\quad (2,2) \rightarrow 2 = -2 + (\frac{1}{2})^{2A+b} \rightarrow 2A + b = -2$

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

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(۷)

$A \times (\frac{8}{9})^{\frac{t}{60}} = \frac{A}{6} \rightarrow (\frac{8}{9})^{\frac{t}{60}} = \frac{1}{6}$ $\quad \frac{t}{60} = \frac{\log \frac{1}{6}}{\log \frac{8}{9}} = \frac{-(\log 2 + \log 3)}{3\log 2 - 2\log 3} \xrightarrow{\div \log 2}$

$\frac{-1 - \log_2 3}{3 - 2\log_2 3}$ * $\quad \log_2 5 = 2/4$, $\log_3 5 = 1/4 \rightarrow \frac{\log_2 5}{\log_3 5} = \frac{2/4}{1/4} \rightarrow \log_2 3 = \frac{12}{7}$

$\frac{t}{60} = \frac{-1 - \frac{12}{7}}{-\frac{24}{7} + 3} = \frac{\frac{19}{7}}{\frac{3}{7}} = \frac{19}{3} \rightarrow t = 20 \times 19 = (380)$

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(۸) چون عنصر در هر هفته (۷ روز) ٪۱۲٫۵ از جرم خود را از دست می‌دهد، پس جرم عنصر در هر هفته $\frac{7}{8}$ برابر

$m = m_0 (\frac{7}{8})^{\frac{t}{7}} \rightarrow \frac{1}{7} m_0 = m_0 (\frac{7}{8})^{\frac{t}{7}} \Rightarrow (\frac{7}{8})^{\frac{t}{7}} = \frac{1}{7} \rightarrow \log_3 (\frac{7}{8})^{\frac{t}{7}} = \log_3 \frac{1}{7} \rightarrow \frac{t}{7} \log_3 (\frac{7}{8}) = \log_3 \frac{1}{7}$

$\frac{t}{7} (\log_3 7 - \log_3 8) = -\log_3 7$

$\frac{t}{7} (\frac{5}{3} - 3 \times \frac{5}{8}) = -\frac{5}{3} \rightarrow \frac{t}{7} (-\frac{5}{24}) = -\frac{5}{3} \rightarrow t = 56$

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(۹)

$a_n = a \cdot (\frac{96}{100})^n$ $\quad n(\log 2^5 \times 3 - 2) = -\log 3 \rightarrow n(5\log 2 + \log 3 - 2) = -0/48 \rightarrow n = 24$

$a \cdot (\frac{96}{100})^n = \frac{1}{3} a \rightarrow (\frac{96}{100})^n = \frac{1}{3}$ $\quad \log (\frac{96}{100})^n = \log \frac{1}{3} \rightarrow n(\log 96 - \log 100) = \log 1 - \log 3$

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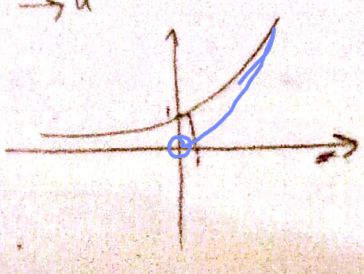
(۱۰)

الف) $y = 9^{\log_3 x} \rightarrow x^2$ $\quad D_f: (0, +\infty)$



ب) $\log_{10} x^2 \rightarrow 2\log_{10} x$

x	10	100	1000
y	2	4	6

$D_f: \mathbb{R} - \{0\}$