گروه یازدهم تجربی — دنیا جمشیدی — تکلیف شماره ۲۵ — ۱۹

①

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

$b + c = -\frac{3}{2}$ ، $(a+c)b = ?$

$(0, 2) \to 1 - \log_c^{-b} = 2$

$\log_c^{-b} = -1 \qquad -b = \frac{1}{c} \qquad b = -\frac{1}{c}$

$-\frac{1}{c} + c = -\frac{3}{2} \xrightarrow{\times c}$

$c^2 + \frac{3}{2}c - 1 = 0 \xrightarrow{\times 2}$

$2c^2 + 3c - 2 = 0 \qquad c^2 + 3c - 4 = 0$

$(c-1)(c+4) = 0$

$c \begin{cases} \frac{1}{2} \ \checkmark \text{ق ق} & 1 \Leftarrow \\ -2 \times \text{غ ق ق} & -4 \text{ مـ} \end{cases}$

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

$(-\frac{3}{2}, 0) \to 1 - \log_{\frac{1}{2}}^{(-\frac{3}{2}a)+2} = 0$

$-\frac{3}{2}a + 2 = \frac{1}{2} \qquad -\frac{3}{2}a = -\frac{3}{2}$

$\boxed{a = 1}$

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

②

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

$f(-1) = ?$

$(1, 0) \to 1 + c \times 3^{a+b} = 0$

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

$(0, \frac{2}{3}) \to 1 + c \times 3^{a} = \frac{2}{3}$

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

$(1) \div (2) \to \frac{3^{a+b}}{3^{a}} = 3^{b} = 3$

$\boxed{b = 1}$

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

$\frac{c \times 3^{a}}{3^{1}} = -\frac{1}{9}$

③

$y = c + \log_5 (ax + b) \qquad \frac{a}{b} = ?$

$(0, 2) \to \begin{cases} c + \log_5 b = 2 \\ c + \log_5 \frac{12}{5}a + b = \ldots \end{cases}$

$(\frac{12}{5}, 0) \to$

$\log_5 b - \log_5 \frac{12}{5}a + b = 2 \to \log_5 \frac{b}{\frac{12}{5}a + b} = 2$

$\frac{b}{\frac{12}{5}a + b} = 25$

$b = 60a + 25b$

$* \ 60a = -24b$

$* \to \boxed{\frac{a}{b} = -\frac{2}{5}}$

s.a.m

ادامه سوال ۵:

$f^{-1}(10) = -1$

$\rightarrow f(-1) = 10$

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

$2^{b+a} = 8 \qquad \begin{cases} b+a = 3 \\ b-a = 1 \end{cases}$

$\boxed{a = 1} \qquad \boxed{b = 2}$

$2b - a = ? \qquad 2(2) - 1 = \boxed{3}$

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(۶)

$f(x) = -2 + \left(\frac{1}{2}\right)^{Ax+B}$

$y = x^2 - x = g(x)$

$f(1) = g(1) = 0$

$f(1) = -2 + \left(\frac{1}{2}\right)^{A+B} = 0$

$\left(\frac{1}{2}\right)^{A+B} = 2 \qquad * \; A+B = -1$

$f(2) = g(2) = 2$

$f(2) = -2 + \left(\frac{1}{2}\right)^{2A+B} = 2$

$\left(\frac{1}{2}\right)^{2A+B} = 4 \qquad \begin{cases} 2A+B = -2 \\ A+B = -1 \end{cases}$

$\boxed{A = -1, \; B = 0}$

$f(3) = -2 + \underbrace{\left(\frac{1}{2}\right)^{-3}}_{8} = \boxed{6}$

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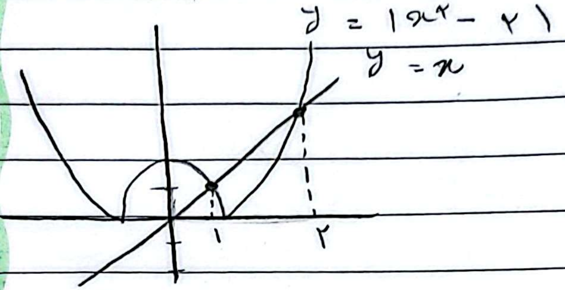
(۴)

$f(x) = \log_2 (|x^2 - 2| - x)$

$D_f = ?$

$|x^2 - 2| - x > 0$



$|x^2 - 2| = x$

$\begin{cases} 2 - x^2 = x \rightarrow x^2 + x - 2 = 0 & \begin{cases} x = 1 \\ x = -2 \end{cases} \\ x^2 - 2 = x \rightarrow x^2 - x - 2 = 0 & \begin{cases} x = -1 \\ \boxed{x = 2} \end{cases} \end{cases}$

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

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(۵)

$\begin{cases} f(x) = 2 + 2^{b - ax} \\ g(x) = -x^2 - 3x + 8 \end{cases}$

$f(1) = 2 + 2^{b-a} = 4 \rightarrow 2^{b-a} = 2$

$g(1) = -1 - 3 + 8 = 4 \qquad \boxed{b - a = 1}$

s.a.m

$\log_{2}^{3} = 1.6 \Rightarrow \log_{3}^{32} = \frac{5}{8}$

$\log_{7}^{3} = 0.6 \quad \log_{3}^{7} = \frac{5}{3}$

$m \times \left(\frac{7}{8}\right)^{n} = \frac{1}{7} m$ ⑧

$\left(\frac{7}{8}\right)^{n} = \frac{1}{7} \quad n = \log_{\frac{7}{8}}^{\frac{1}{7}}$

$= -\left(\log_{\frac{7}{8}}^{7}\right)$

$\log_{7}^{\frac{7}{8}} = \log_{7}^{7} - \log_{7}^{8} \quad (3\log_{7}^{2})$ = 9

$\log_{7}^{2} = ? \quad \log_{7}^{2} = \frac{\log_{3}^{2}}{\log_{3}^{7}} = \frac{\frac{5}{8}}{\frac{5}{3}}$

$= \frac{3}{8}$

$\log_{7}^{\frac{7}{8}} = 1 - \frac{9}{8} = -\frac{1}{8}$

$\log_{\frac{7}{8}}^{\frac{1}{7}} = 8$ هفته $= 8 \times 7 =$

(۵۶ روز)

$\log_{2}^{5} = 2.4 \rightarrow \frac{\log_{5}^{2}}{\log_{5}^{3}} = \frac{\frac{5}{12}}{\frac{5}{7}}$ ⑦

$\log_{3}^{5} = 1.4$

$m \times \left(\frac{8}{9}\right)^{n} = \frac{1}{6} m \quad \log_{3}^{2} = \frac{7}{12}$

$\left(\frac{8}{9}\right)^{n} = \frac{1}{6} \quad n = \log_{\frac{8}{9}}^{\frac{1}{6}} = ?$

$\log_{\frac{8}{9}}^{\frac{1}{6}} = -\left(\log_{\frac{8}{9}}^{6}\right)$

$= \log_{\frac{8}{9}}^{2} + \log_{\frac{8}{9}}^{3}$

$= \frac{1}{\log_{2}^{\frac{8}{9}}} = \frac{1}{\log_{2}^{8} - \log_{2}^{9}} = \frac{1}{-\frac{3}{7}}$

$3 \quad 2\log_{2}^{3} = 2\left(\frac{12}{7}\right)$ = 9

$= -\frac{7}{3} = \log_{\frac{8}{9}}^{2}$ ★

$\log_{\frac{8}{9}}^{3} = \frac{1}{\log_{3}^{\frac{8}{9}}} = \frac{1}{\log_{3}^{8} - \log_{3}^{9}}$

$3\log_{3}^{2} = 3\left(\frac{7}{12}\right) \quad 4 \quad 2$

$= \frac{1}{-\frac{1}{4}} = -4 = \log_{\frac{8}{9}}^{3}$ ★

$n = \log_{\frac{8}{9}}^{\frac{1}{6}} = -1\left(-\frac{7}{3} - 4\right) = 4\frac{7}{3} = \frac{19}{3}$

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

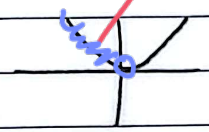
s.a.m

$\log 2 = 0{,}30$ $\quad$ $\log 3 = 0{,}48$

⑩

الف) $y = 9^{\log_3 x} = x^2$

$\Rightarrow y = x^2$

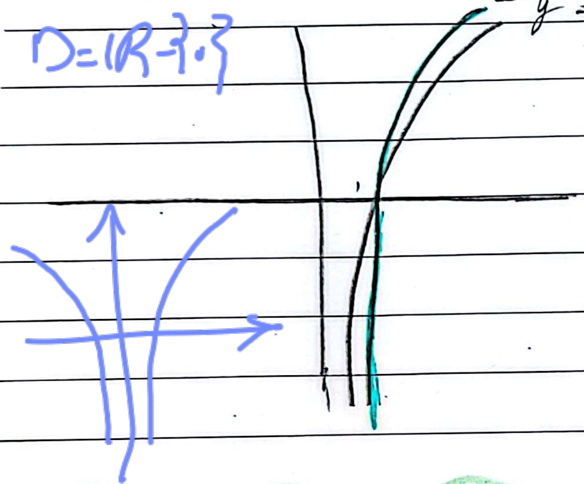


$D = (0, +\infty)$

ب) $y = \log x^2 = 2\log x$

$y = \log x$

$D = \mathbb{R} - \{0\}$



⑨

$x \times \left(\frac{96}{100}\right)^n = \frac{1}{3}x$

$n = \log_{\frac{96}{100}} \frac{1}{3} = -\left(\log_{\frac{96}{100}} 3\right) =$

$\log_{0{,}96} 3 = \frac{1}{\log_3 \frac{96}{100}} \to -24$

$\log_3 \frac{96}{100} \Big\} \log_3 \frac{96}{3} - \log_3 \frac{100}{3}$

$5\log_3 2 + \log_3 3 \qquad 2\log_3 \frac{10}{3}$

$\frac{25}{8} \qquad 1 \qquad \frac{25}{6}$

$\log_3 2 = \frac{\log 2}{\log 3} = \frac{0{,}30}{0{,}48} = \frac{30}{48} =$

$\frac{5}{8} \Big\} \quad \log_3 10 = \frac{1}{\log 3} = \frac{100}{48}$

$= \frac{25}{12} \Big\}$

جواب $= 24$

$n = 24$ روز

s.a.m