۲

$\begin{vmatrix} -\frac{3}{2} \\ 0 \end{vmatrix} \to 0 = 1 - \log_c^{(-\frac{3}{2}a-b)} \to -\frac{3}{2}a - b = c \to a = \frac{c}{-\frac{3}{2}(-\frac{3}{2})} = \frac{19,25}{\text{①}}$

$\begin{vmatrix} 0 \\ 2 \end{vmatrix} \to 2 = 1 - \log_c^{-b} \to -b = c^{-1} \to b = -\frac{1}{c}$, $b + c = -\frac{3}{2} \to c - \frac{1}{c} = -\frac{3}{2}$

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

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

$2c^2 + 3c - 2 = 0$

$(2c - 1)(c + 2) = 0$

$c = \frac{1}{2}$, $c = -2$ ✗

$(a+c)^b = (\frac{3}{2})^{(-2)} = \boxed{\frac{4}{9}}$ ✓ $\qquad (a+c)b = (\frac{3}{2})(-2) = \boxed{-3}$ ✓

۲

$A \begin{vmatrix} 1 \\ 0 \end{vmatrix} \to 0 = 1 + c \times 3^{a+b} \to 3^{a+b} = -\frac{1}{c} \to 3^a \times c = \frac{-1}{3^b} = -\frac{1}{3^1}$

$B \begin{vmatrix} 0 \\ \frac{2}{3} \end{vmatrix} \to \frac{2}{3} = 1 + c \times 3^{a+b} \to -\frac{1}{3c} = 3^a \times c \to 3^{a+1} \times 3^a = 3^{-1} \to 3^{2a+1} = 3^{-1} \to 2a + 1 = -1 \to a = -1$

$\to b = 1 \to f_{(-1)} = 1 + c \times 3^a \times 3^{-b} = 1 + (-\frac{1}{3} \times \frac{1}{3}) = \boxed{\frac{8}{9}}$ ✓

۳

$A \begin{vmatrix} 2,4 \\ 0 \end{vmatrix} \quad 0 = c + \log_3^{(2,4a+b)}$ $\qquad B \begin{vmatrix} 0 \\ 2 \end{vmatrix} \quad 2 = c + \log_3^b \to b = 3^{2-c} = 2 \times 3^{-c}$

$\to 3^{-c} = 2,4a + b = 2,4a + 3^{2-c} \to 2,4a = -2 \times 3^{-c} \to a = -1 \times 3^{-c}$

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

۴

$|x^2 - 2| - x \geq 0$

$x^2 - 2 \geq 0 \to x \geq \sqrt{2}$, $x \leq -\sqrt{2}$ ①

$x^2 - x - 2 \geq 0 \to (x+1)(x-2) \geq 0$

	-1		2	
	+	0	−	0	+

$(-\infty, -1] \cup [2, +\infty)$ ②

$\to$ ① $\cap$ ② $= (-\infty, -\sqrt{2}) \cup [2, +\infty)$ (B)

$x^2 - 2 < 0 \to -\sqrt{2} < x < \sqrt{2}$ ①′

$-x^2 + x + 2 \geq 0 \to x^2 - x - 2 \leq 0 \to (x-2)(x+1) \leq 0$

	-1		2	
	+	0	−	0	+

$[-1, 2]$ ②′

$\to$ ①′ $\cap$ ②′ $= [-1, \sqrt{2})$ (A)

(A) $\cup$ (B) $= (-\infty, -1] \cup [2, +\infty)$ ✓ (بازه)

۵

$g_{(1)} = -1 - 3 + 8 = 4 \to \begin{vmatrix} 1 \\ 4 \end{vmatrix} \to f_{(1)} = 4 = 2 + 2^{b-a} \to 1 = b - a$

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

$\to b = 2$, $a = 1$ ✓

$\to 2b - a = \boxed{3}$ ✓

$y = x^2 - x \rightarrow \begin{vmatrix} 1 & 0 \\ 0 & 0 \end{vmatrix} \begin{vmatrix} 2 & 0 \\ 2 & 0 \end{vmatrix}$

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

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

$\Rightarrow A = -1 \, , \, B = 0$

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

۴ (۲)

$\frac{x}{4} = x \times \left(\frac{8}{9}\right)^{\frac{t}{40}} \longrightarrow \frac{1}{4} = \left(\frac{8}{9}\right)^{\frac{t}{40}} \rightarrow \log_{\frac{8}{9}}^{\frac{1}{4}} = \log_{\frac{8}{9}}^{\left(\frac{8}{9}\right)^{\frac{t}{40}}}$

$\rightarrow -\log_{\frac{8}{9}}^{4} = \frac{t}{40} \times \left(\log_{\frac{8}{9}}^{8} - \log_{\frac{8}{9}}^{9}\right) \rightarrow +\left(\frac{t}{40}\right)^{-1} = -\frac{3\log_{\frac{8}{9}}^{2} - 2\log_{\frac{8}{9}}^{3}}{\log_{\frac{8}{9}}^{2} + \log_{\frac{8}{9}}^{3}} \Rightarrow \boxed{t = 38}$ ✗

$\log_{\frac{8}{9}}^{3} = 2,4$

$\rightarrow \log_{\frac{8}{9}}^{2}\left(\frac{10}{24}\right)$

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

$\log_{\frac{8}{9}}^{3} = \left(\frac{10}{14}\right)$

۷ (۲)

$\frac{a}{5} = a \times \left(\frac{1}{8}\right)^{\frac{t}{7}} \longrightarrow \log_{7}^{\frac{1}{5}} = \log_{7}^{\left(\frac{1}{8}\right)^{\frac{t}{7}}} \rightarrow -\log_{7}^{5} = \frac{t}{7} \times \left(\log_{7}^{1} - \log_{7}^{8}\right)$

$\rightarrow \frac{1}{5} = \left(\frac{7}{8}\right)^{\frac{t}{7}}$

$-1 = \frac{t}{7} \times \left(1 - 3\log_{7}^{2}\right) \rightarrow t = \frac{-7}{1 - 3\left(\frac{1}{3}\right)} = \frac{-7}{-\frac{1}{8}} = \boxed{36}$ ✓

۸ (۲)

$\log_{2}^{3} = 1,6 \rightarrow \log_{3}^{2} = \frac{10}{16}$

$\log_{3}^{2} \times \log_{7}^{3} = \frac{10}{16} \times \frac{6}{10} = \frac{3}{8} = \log_{7}^{2}$

$\frac{a}{3} = a \times \left(\frac{94}{100}\right)^{t} \rightarrow \frac{1}{4} = \left(\frac{94}{100}\right)^{t} \rightarrow \log^{\frac{1}{4}} = \log^{\left(\frac{94}{100}\right)^{t}}$

$\Rightarrow -\log^{4} = t \times \left(\log^{94} - \log^{100}\right) \Rightarrow -\log^{2^2} = t \times \left(\log^{2\times 47} - \log^{2^2 \times 5^2}\right)$

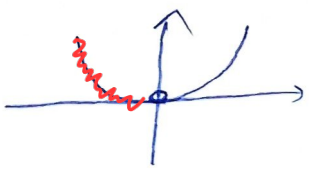
$-0,6021 \quad 0,3010 \quad 1,6721$

$t = \frac{-0,6021}{-0,0252} = \boxed{24}$ ✓

۹ (۲)

$y = 9^{\log_{3}^{x}} = x^{\log_{3}^{9}} = x^{2}$

دقت! $x > 0$

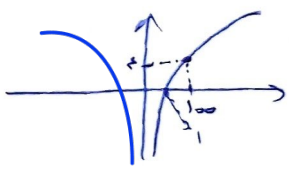


$y = \log^{x^2} = \log^{x \times x} = \log^{x} + \log^{x} = 2\log^{x}$

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

$x^2 > 0 \longrightarrow x \neq 0$

$\rightarrow$ ~~$x > 0$~~



۱۰ (۱٫۲۵)