امیرمحمد [illegible] یازدهم B

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

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

$\to \begin{cases} c = \frac{1}{2} & \text{ق ق} \\ c = -2 & \text{غ ق ق} \end{cases} \to c = \frac{1}{2} \to b = -2 \} \; x = -1.5 \to y = 1 - \log_c^{-1.5a-b} = 0$

$\to -1.5a - b = c \to -1.5a + 2 = \frac{1}{2} \to a = 1 \to (a+c)b = ③$

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

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

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

③ $x=0 \to y = c + \log_5^b = 2 \to -\log_5^b + 2 = c$

$x = 2.4 \to y = c + \log_5^{2.4a+b} = 0 \to 2 - \log_5^b + \log_5^{2.4a+b} = 0$

$\to \log_5^{2.4a+b} = \log_5^b - 2 \to \log_5^{2.4a+b} = \log_5^{\frac{b}{25}} \to 2.4a + b = \frac{b}{25}$

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

④ $f(x) = \log_4^{(|x^2-2|-x)} \to |x^2-2| - x > 0 \to |x^2-2| > x \to \begin{cases} x^2-2 > x & x \le -\sqrt{2},\ x \ge \sqrt{2} \\ x^2 - 2 < x & -\sqrt{2} < x < \sqrt{2} \end{cases}$

$\to x^2 - 2 > x \to x^2 - x - 2 > 0 \to (x+1)(x-2) > 0 \to$ (−1, 2: + − +)

$\to x^2 - 2 < x \to x^2 + x - 2 < 0 \to (x-1)(x+2) < 0 \to$ (−2, 1: + − +)

$\xrightarrow{\cup} D_f = (-\infty, 1) \cup (2, +\infty)$

⑤ $x=1 \to g(1) = -1 - 3 + 8 = 4 = f(1) = 2 + 2^{b-a} \to 2^{b-a} = 2 \to b - a = 1$

$f^{-1}(10) = -1 \to f(-1) = 10,\ f(-1) = 2 + 2^{b+a} \} \to 2 + 2^{b+a} = 10 \to 2^{b+a} = 8 \to b + a = 3$

$2b = 4 \to b = 2$

$\to a = 1$

$\longrightarrow 2b - a = 4 - 1 = ③$

(۶) $x=1 \rightarrow 0 = -۲ + (\frac{1}{۲})^{A+B} \rightarrow (\frac{1}{۲})^{A+B} = ۲ \rightarrow A+B=-1$

$x=۲ \rightarrow ۲ = -۲ + (\frac{1}{۲})^{۲A+B} \rightarrow ۴ = (\frac{1}{۲})^{۲A+B} \rightarrow ۲A+B=-۲$

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

$\rightarrow f(x) = -۲ + (\frac{1}{۲})^{-x} \xrightarrow{x=۳} f(۳) = -۲+۸ = ۶$

(۷) $(\frac{۸}{۹})^{\frac{t}{۶۰}} m = \frac{1}{۴} m \rightarrow \frac{t}{۶۰} \log\frac{۸}{۹} = \log\frac{1}{۴} \xrightarrow{\times(-1)} (-\frac{t}{۶۰}) \log\frac{۸}{۹} = -\log\frac{1}{۴}$

$\rightarrow (\frac{t}{۶۰}) \log\frac{۹}{۸} = \log ۴ \rightarrow \frac{t}{۶۰} = \frac{\log ۴}{\log \frac{۹}{۸}} = \frac{\log ۲ + \log ۲}{۲\log ۳ - ۳\log ۲} = \frac{\frac{1}{۳/۳} + \frac{1}{۳/۳}}{\frac{۲}{۲/۱} - \frac{۳}{۳/۳}}$

$= \frac{۳/۸}{۰/۶} = \frac{۳۸}{۶} = \frac{۱۹}{۳} \rightarrow \frac{t}{۶۰} = \frac{۱۹}{۳} \rightarrow t = ۳۸۰ \text{ min}$

(۸) $m(\frac{۷}{۸})^{\frac{t}{۷}} = \frac{1}{۷} m \rightarrow (\frac{۸}{۷})^{\frac{t}{۷}} = ۷ \rightarrow (\frac{t}{۷}) \log\frac{۸}{۷} = \log ۷$

$\rightarrow \frac{t}{۷} = \frac{\log ۷}{\log \frac{۸}{۷}} = \frac{\log ۷}{\log ۸ - \log ۷} = \frac{\log_۳ ۷}{۳\log_۳ ۲ - \log_۳ ۷} = \frac{1}{\frac{۱/۸ - ۱/۶}{(۱/۶)(۰/۶)}} = \frac{۱/۶}{۰/۲} = ۸$

$\rightarrow \frac{t}{۷} = ۸ \rightarrow t = ۵۶$ Day

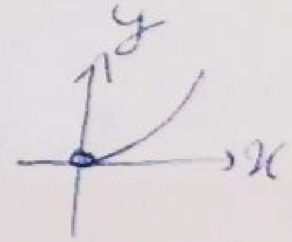
(۹) $(\frac{۲۴}{۲۵})^t = \frac{1}{۳} \rightarrow \frac{1}{۳} = (\frac{۹۶}{۱۰۰})^t \rightarrow (t) \log\frac{۹۶}{۱۰۰} = \log\frac{1}{۳} \rightarrow t(\log ۹۶ - ۲) = -\log ۳$

$\rightarrow t(۵\log ۲ + \log ۳ - ۲) = -\log ۳ \rightarrow t(۱/۵ + ۰/۴۸ - ۲) = -(۰/۴۸)$

$\rightarrow t = ۲۴$ Day

(۱۰)

الف) $y = ۹^{\log_۳ x} = x^{\log_۳ ۹} = x^۲ \quad D_y = (0, +\infty) \rightarrow$



ب) $y = \log x^۲ \rightarrow x^۲ > 0 \rightarrow x \neq 0$

$\rightarrow \log x^۲ = ۲\log x \rightarrow D_y = \mathbb{R} - \{0\}$