نام و نام خانوادگی: رزا صمدی ۲۰ شماره تکلیف: ۲۳ کلاس: سه‌شنبه‌ها گروه B دختران دوم

$\log_n^m = a \qquad \log_{mn}^{m^2n} = b$

$[b] \qquad \log_{mn}^{m^2n} = \frac{\log_n^{m^2n}}{\log_n^{mn}} = \frac{\log_n^n + 2\log_n^m}{\log_n^n + \log_n^n} = \frac{1+2a}{1+a}$ ص ۱

$\to [b] = [\frac{1+2a}{1+a}] = [1+\frac{a}{1+a}] = 1 + [\overset{0}{\frac{a}{1+a}}] = \boxed{1}$

الف) $y = \sqrt{\frac{x}{\log_{\frac{1}{2}}^x}}$

$\log_{\frac{1}{2}}^x \neq 0 \to x \neq 1$ ①

$\frac{x}{\log_{\frac{1}{2}}^x} \geq 0 \xrightarrow{x>0} \log_{\frac{1}{2}}^x > 0 \to x < 1$ ②

③ $x > 0$

③ ∩ ① ∩ ② $= D = \boxed{(0, 1)}$

ب) $y = \frac{\log_4^{x^2-x-2}}{\sqrt{x^2-1}+1} \to D = (-\infty, -1) \cup (2, +\infty)$

همواره مثبت

$x^2 - x - 2 > 0$

$(x-2)(x+1) > 0$ $\quad -1 \quad 2 \quad + \; - \; +$ د ۲

صورت $D = (-\infty, -1) \cup (2, +\infty)$

مخرج $D \quad x^2 - 1 \geq 0 \to x^2 \geq 1 \to (-\infty, -1)(1, +\infty)$

$2\log_x^a + \log_a^{\sqrt{x}} = 2 \quad , x = 9$

یا $2\log_x^a + \frac{1}{\log_{\sqrt{x}}^a} = 2 \to 2\log_x^a + \frac{1}{2\log_x^a} = 2 \to 2t + \frac{1}{2t} = 2 \to 4t^2 - 4t + 1 = 0$ ۳

$\to (2t-1)^2 = 0 \to 2t = 1 \to t = \frac{1}{2} \to \log_9^a = \frac{1}{2} \to a = 9^{\frac{1}{2}} \to a = \sqrt{9}$ د

$\to \boxed{a = 3}$

$\log^2 = 0/3 , \log^3 = 0/4 \to \log^2 = \log^{10} - \log^5 = 0/3 \to 0/7 = \log^5$

$(\log_{10}^{\frac{5}{3}})x^2 + (\log^9)x - \log^{15} = 0$

$(\log^5 - \log^3)x^2 + (2\log^3)x - (\log^3 + \log^5) = (0/7 - 0/4)x^2 + (2 \times 0/4)x - (0/7 + 0/4)$ د ۴

$= (0/3)x^2 + (0/8)x - 1/1 = 0 \to 3x^2 + 8x - 11 = 0 \to \Delta = 64 + 4 \times 3 \times 11 = 196$

$\to \frac{-8 \pm 14}{6} \Rightarrow \{1, -\frac{11}{3}\} \leftarrow x$

$\boxed{1 + \frac{11}{3} = \frac{14}{3}}$

$\log_2^7 = 2/8$ و $\log_5^2 = 0/5 = \frac{1}{\log_2^5} = \frac{5}{10} = \frac{1}{2} \to \log_2^5 = 2$

$\log_{14}^{10} = \frac{\log_2^{10}}{\log_2^{14}} = \frac{\log_2^2 + \log_2^5}{\log_2^7 + \log_2^2} = \frac{1+2}{2/8+1} = \frac{3}{3/8} = \boxed{\frac{30}{38}}$ د ۵

$\log_3^5 = 1/5 \quad , \quad \log_2^3 = 1/6$

$\log_3^5 = \dfrac{\log_2^5}{\log_2^3} = 1/5 \rightarrow \log_2^5 = 2/4$

$\log_{15}^6 = \dfrac{\log_2^6}{\log_2^{15}} = \dfrac{\log_2^2 + \log_2^3}{\log_2^3 + \log_2^5} = \dfrac{1+1/6}{1/6+2/4} = \dfrac{2/6}{4} = \boxed{0/65}$ 6

$\log_8^{18} = \frac{1}{3}(\log_2^9 + \log_2^2) = 2m \rightarrow 2\log_2^3 + 1 = 6m \rightarrow \log_2^3 = \dfrac{6m-1}{2}$

$\log_4^{12} = \frac{1}{2}\log_2^{12} = \frac{1}{2}(\log_2^3 + \log_2^4) = \frac{1}{2}\left(\frac{6m-1}{2} + 2\right) = \boxed{\dfrac{6m-1}{4} + 1}$ 7

$\left(\frac{4}{10}\right)^{2x-1} = \left(\frac{125}{8}\right)^{x^2} \rightarrow \left(\frac{2}{5}\right)^{2x-1} = \left(\frac{2}{5}\right)^{-3x^2} \rightarrow 2x-1 = -3x^2$

$\rightarrow 3x^2 + 2x - 1 = 0 \rightarrow -1 \ , \ \frac{1}{3}$

$\log_8^{9x+1} \quad \xrightarrow{} x=-1 \rightarrow \log_8^{-8} \ \times$

$\xrightarrow{} x = \frac{1}{3} \rightarrow \log_8^4 = \boxed{\frac{2}{3}}$ 8

$\log_2^3 = a \quad \Rightarrow 2^a = 3$

$\log_8^b \quad \Rightarrow b = 8^{\frac{2}{3}a} \times 8^{\frac{2}{3}} = 2^{2a} \times 2^2 = 3^2 \times 2^2 = \boxed{36 = b}$

$\boxed{\log_{10}^{100} = 2}$ 9

$S = x_1 + x_2 \rightarrow \frac{1}{S} = \frac{1}{x_1+x_2} = 2\log^2 \rightarrow \dfrac{1}{\frac{b}{4a}} = \dfrac{4a}{\cancel{b}} = 2\log^2 \rightarrow \dfrac{2a-c}{2a} = \log_2^{10}$

$2a-c$

$1 - \frac{c}{2a} = \log_2^{10} \rightarrow \frac{c}{2a} = 1 - \log_2^{10} \xrightarrow{\times 2} \frac{c}{a} = 2 - \log_2^{100}$

$\left(\frac{1}{\sqrt[8]{2}}\right)^{\frac{c}{a}} = \left(\frac{1}{\sqrt[8]{2}}\right)^{2-\log_2^{100}} = \left(2^{\frac{1}{8}}\right)^{-2+\log_2^{100}} \longrightarrow \left(\frac{2^2}{2^{\log_2^{100}}}\right)^{-\frac{1}{8}} = \left(\frac{4}{100}\right)^{-\frac{1}{8}}$ 10

$\rightarrow \left(\frac{100}{4}\right)^{+\frac{1}{8}} \rightarrow (25)^{\frac{1}{8}} \rightarrow (5^2)^{\frac{1}{8}} \rightarrow 5^{\frac{1}{4}} = \boxed{\sqrt[4]{5}}$