Subject: ۲۴ تکلیف شماره ۱ — یازدهم دفتر B — Date: مینا فروتن

۱-

$f(x) = 3^{Ax+B} \qquad y = x^2 \qquad x = 1, 3$

$f(1) = 3^{A+B}, \quad x = 1 \to y = 1 \Rightarrow 3^{A+B} = 1 \to A+B = 0$

$f(3) = 3^{3A+B}, \quad x = 3 \to y = 9 \qquad 3^{3A+B} = 9, \quad 3A+B = 2$

$A = 1, \; B = -1 \qquad f(x) = 3^{x-1} \longrightarrow x = 0 \to 3^{-1} = \boxed{\frac{1}{3}}$

۲-

$\log_2^{4^x+15} = x+3 \to 2^{x+3} = 4^x + 15 \to 2^x \times 8 = (2^x)^2 + 15$

$2^x = t \to 8t = t^2 + 15 \to t^2 - 8t + 15 = 0 \to (t-3)(t-5) = 0$

$t = 3, 5 \to 2^x = 3 \to x = \log_2^3, \quad x = \log_2^5 \Rightarrow \log_2^3 + \log_2^5 = \boxed{\log_2^{15}}$

۳-

$(\log_{21}^3)^2 + \log_{21}^{147} \times \log_{21}^{1323}$

$\log_{21}^{147} = \log_{21}^{21} + \log_{21}^{7} = 1 + \log_{21}^{7} \qquad \log_{21}^{1323} = \log_{21}^{21^2} + \log_{21}^{3} = 2 + \log_{21}^{3}$

$1 + \log_{21}^{\frac{21}{3}} = 1 + \log_{21}^{21} - \log_{21}^{3} = 2 - \log_{21}^{3}$

$(\log_{21}^3)^2 + (2 - \log_{21}^3)(2 + \log_{21}^3) = (\log_{21}^3)^2 + 4 - (\log_{21}^3)^2 = \boxed{4}$

۴-

$\log_{10}^{x^2-2x+1} + 3\log(1-x) = 5 \to (x^2-2x+1)(1-x)^3 = 10^5$

$(1-x)^2 (1-x)^3 = 10^5 \to (1-x)^5 = 10^5 \to 1-x = 10 \to x = -9$

$\log_3^{-x} = \boxed{\log_3^9 = 2}$

s.a.m

Subject: Date:

$\log_2^{x^2+2x+4} + \log_2^{x-2} = 3 \to (x^2+2x+4)(x-2) = 2^3$ ۵-

$x^3 - 8 = 8 \to x^3 = 16 \to x = \sqrt[3]{16}$ $\quad \log_{\sqrt[3]{2}}^{x} = \log_{\sqrt[3]{2}}^{\sqrt[3]{16}} =$

$\frac{\cancel{\frac{1}{3}}}{\cancel{\frac{1}{3}}} \log_2^{16} = \log_2^{16} = \boxed{4}$

$\log(2-x) - \log\frac{1}{(x-2)^2} = 3 \to \log^{2-x} + \log(x-2)^2 = 3$ ۶-

$(x-2)^2 = (2-x)^2 \to \log(2-x)(2-x)^2 = 3 \to (2-x)^3 = 10^3$

$2-x = 10 \to x = -8 \to \log_{\sqrt{2}}^{+8} = \log_{2^{\frac{1}{2}}}^{2^3} = \frac{3}{\frac{1}{2}} \log_2^2 = \boxed{6}$

$3^{x^2-2} = 81^x \;,\; 3^{x^2-2} = 3^{4x} \to x^2-2 = 4x$ ۷-

$x^2 - 4x - 2 = 0 \to x = 2 \pm \sqrt{6} \to 2-\sqrt{6}$ ✗ → چون منفی می‌شود

$\log_6^{x-2} = \log_6^{2+\sqrt{6}-2} = \log_6^{\sqrt{6}} = \frac{1}{2}\log_6^6 = \boxed{\frac{1}{2}}$

$\log_3^2 = \frac{5}{8} \qquad \log_{18}^8 = ?$ ۸-

$\log_{18}^8 = \frac{\log_3^8}{\log_3^{18}} = \frac{3\log_3^2}{\log_3^9 + \log_3^2} = \frac{3 \times \frac{5}{8}}{2 + \frac{5}{8}} = \frac{15}{21} \to \boxed{\frac{5}{7}}$

$\log_4^3 = 0.8 \qquad \log_{12}^6 = ? \qquad \log_{12}^6 = \frac{\log_4^6}{\log_4^{12}} = \frac{\log_4^3 + \log_4^2}{\log_4^3 + \log_4^4} =$ ۹-

$\frac{0.8 + \frac{1}{2}}{0.8 + 1} = \frac{\frac{13}{\cancel{10}}}{\frac{18}{\cancel{10}}} = \boxed{\frac{13}{18}}$

s.a.m

$(a\log 2)x^2 + ax + b\log 2 = 0 \quad x = -1 \,, \quad (\sqrt{2})^{\frac{b}{a}}$ -10

$x = -1 \to a\log 2 - a + b\log 2 = 0 \to \log 2 = \frac{a}{a+b} \Rightarrow \log_2 10 = 1 + \frac{b}{a}$

$\log_2 10 - 1 = \frac{b}{a} \to \log_2 10 - \log_2 2 = \frac{b}{a} \to \log_2 5 = \frac{b}{a}$

$(\sqrt{2})^{\frac{b}{a}} = (2^{\frac{1}{2}})^{\log_2 5} \xrightarrow[\text{عوض کردن}]{} (5^{\frac{1}{2}})^{\log_2 2} = (\sqrt{5})^1 = \boxed{\sqrt{5}}$