رزانو صدرالعلمایی یازدهم دختر ۲ تکلیف ۲۴

۱-

$f(x) = 3^{Ax+B}$ $y = x^2$

$A \begin{vmatrix} 1 \\ 1 \end{vmatrix}$ $B \begin{vmatrix} 3 \\ 9 \end{vmatrix}$ $\longrightarrow$ $1 = 3^{A+B} = 3^0 \rightarrow A+B=0$

$9 = 3^{3A+B}$ $3A+B=2$

$2A = 2 \rightarrow A=1 \quad B=-1$

$\longrightarrow f(x) = 3^{x-1} \xrightarrow{x=0} 3^{-1} = \boxed{\frac{1}{3}}$ نقطه برخورد با محور y

۲-

$\log_2^{(4^x+15)} = x+3$ $2^{x+3} = 2^{2x} + 15 \longrightarrow 2^{2x} - 2^3 (2^x) + 15 = 0$

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

$\longrightarrow 2^x = 3 \quad , \quad 2^x = 5$

$\log_2^3 = x \quad \log_2^5 = x \longrightarrow \log_2^5 + \log_2^3 = \boxed{\log_2^{15}}$

۳-

$(2\log_{21}^7 + \log_{21}^3)(3\log_{21}^3 + 2\log_{21}^7)$ $\log_{21}^{21} - \log_{21}^3 = \log_{21}^7$ $1-t$

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

$t^2 + (2-2t+t)(3t+2-2t) \rightarrow t^2 + (-t+2)(t+2)$

$t^2 + (4-t^2) = \boxed{4}$

۴-

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

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

$1-x = 10 \longrightarrow x = -9$

$\log_3^{(-x)} = \log_3^{3^2} = 2$

۵-

$\log_2^{(x^2+2x+4)} + \log_2^{x-2} = 3$ $\log_2^{2^3}$ $(x^2+2x+4)(x-2) = 8$

$x^3 - 8 = 8 \longrightarrow x^3 = 16 \longrightarrow x = \sqrt[3]{16}$

$\log_{\sqrt{2}}^{\sqrt[3]{16}}$ $\log_2^{16} = 4$

۶-

$\log^{(2-x)} - \log^{\frac{1}{(x-2)^2}} = 3 \longrightarrow \log^{\frac{(2-x)}{\frac{1}{(x-2)^2}}} = \log^{(2-x)^3} = \log_{10}^{10^3} \longrightarrow 2-x = 10 \rightarrow x = -8$

$\log_{\sqrt{2}}^{(-x)} \rightarrow \log_{2^{\frac{1}{2}}}^{2^3} \rightarrow 6$

۷-

$3^{x^2-2} = 81^x = 3^{4x}$ $\quad \log_6^{x-2} \longrightarrow \log_6^{2+\sqrt6-2} = \log_6^{\sqrt6} = \frac{1}{2}$

$x^2-4x-2=0$

$x = \frac{4\pm\sqrt{16+8}}{2} = \frac{4\pm2\sqrt6}{2} = 2\pm\sqrt6$ (غ ق ق)

۸-

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

۹-

$\log_4^3 = 0.8$ $\quad \log_{12}^6 = ? = \frac{\log_4^6}{\log_4^{12}} = \frac{\log_4^2+\log_4^3}{\log_4^3+\log_4^4} = \frac{0.5+0.8}{0.8+1} = \frac{1.3}{1.8}$

$= \boxed{\frac{13}{18}}$

۱۰-

$(a\log^2)x^2+ax+b\log^2=0 \quad x=-1 \quad (\sqrt2)^{\frac{b}{a}} = 2^{\frac12\frac{b}{a}} = a^{\frac12} = \boxed{\sqrt a}$

$a\log^2 - a + b\log^2 = 0 \longrightarrow \log 2^a + \log 2^b - a = 0 = \log 2^a\times2^b = a \quad 2^{a+b} = 10^a$

$2^{b\times\frac1a} = a^{a\times\frac1a} = 2^{\frac{b}{a}} = a$