نام و نام خانوادگی: فاطمه سلیمی　　کلاس: یازدهم دختر A　　شمارهٔ تکلیف = 24

$x^2 = 3^{Ax+B} \longrightarrow x=1 \to 1 = 3^{A+B} \to \boxed{A+B=0}$ (1)

$\hookrightarrow x=3 \longrightarrow 3 = 3^{3A+B} \to \boxed{3A+B=1}$ (2)

$\Rightarrow \boxed{A=\frac{1}{2}}, \boxed{B=-\frac{1}{2}} \rightsquigarrow f(x) = 3^{\frac{1}{2}x-\frac{1}{2}}$

نقطهٔ تلاقی $f(x)$ با محورها $\Rightarrow 3^{-\frac{1}{2}} = \sqrt{\frac{1}{3}}$

★ جواب　1

$2^{x+3} = 4^x + 15 \to 2^x \times 8 = 2^{2x} + 15 \Rightarrow 2^{2x} - 8 \times 2^x + 15 = 0 \xrightarrow{2^x = t} (t-3)(t-5) = 0$

$t = 3 = 2^x \rightsquigarrow \log_2^3 = x$

$t = 5 = 2^x \rightsquigarrow \log_2^5 = x$

جمع جواب‌ها $= \log_2^3 + \log_2^5 = \log_2^{15}$　2

$\underbrace{(\log_{21}^3)}_{a}\underbrace{(\log_{21}^3)}_{a} + \underbrace{(\log_{21}^{7^2\times 3})(\log_{21}^{7^2\times 3^3})}_{(2\log_{21}^7 + \log_{21}^3)(2\log_{21}^7 + 3\log_{21}^3)} = \xrightarrow[\log_{21}^3 = a]{\log_{21}^7 = b} (2b+a)(2b+3a) + a^2 = 4a^2 + 8ab + 4b^2 =$

$4(a^2 + 2ab + b^2) =$

$4(a+b)^2 = 4$

★ جواب 4　3

$\log (x^2-2x+1)(1-x)^3 = \log 10^5 \rightsquigarrow 10^5 = (1-x)^2(1-x)^3 \Rightarrow (1-x)^5 = 10^5 \Rightarrow x = -9$

$\hookrightarrow -x = 9$

$\Longrightarrow \log_3^9 = \boxed{2}$

★ جواب　4

$\log_2 (x^2+2x+4)(x-2) = \log_2^8 \Rightarrow (x^2+2x+4)(x-2) = 8 \xrightarrow{\text{تفاضل مکعبات}} x^3 - 8 = 8$

$\hookrightarrow x^3 = 16$

$\hookrightarrow x = 2\sqrt[3]{2}$　5

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

★ جواب

$\log_{\frac{t}{(2-x)^2}} \frac{1}{(2-x)^2} = 2 \Rightarrow \log t - \log \frac{1}{t^2} = \log \frac{t}{\frac{1}{t^2}} = \log_{10}^{t^3} = 2 \rightarrow 10^2 = t^3 \rightarrow \boxed{t=10}$

$2-x=10 \rightarrow \boxed{-x=8} \Rightarrow \log_{\sqrt{2}}^{8} = \boxed{6}$ ★ جواب

6

$3^{x^2-2} = 3^{4x} \rightarrow x^2-4x-2=0 \rightarrow \Delta = 24 \rightarrow \begin{cases} x_1 = 2+\sqrt{6} \checkmark \text{ق ق} \\ x_2 = 2-\sqrt{6} \notin D \times D \text{ق ق} \end{cases}$

7

$\log_{6}^{x-2} = \log_{6}^{2+\sqrt{6}-2} = \log_{6}^{\sqrt{6}} = \boxed{\frac{1}{2}}$ ★ جواب

$\log_{12}^{8} = \frac{\log_3^8}{\log_3^{12}} = \frac{\log_3^{2^3}}{\log_3^{3\times 4}} = \frac{3\log_3^2}{\log_3^3 + \log_3^4} = \frac{3\times\frac{a}{3}}{\frac{a}{3}+2} \Rightarrow \frac{a}{\frac{a+6}{3}} = \boxed{\frac{3a}{a+6}}$ ★ جواب

8

$\log_{12}^{4} = \frac{\log_2^4}{\log_2^{12}} = \frac{\log_2^2 + \log_2^3}{\log_2^4 + \log_2^3} = \frac{\frac{1}{2}+\frac{1}{3}}{2+\frac{1}{3}} = \boxed{\frac{5}{14}}$ ★ جواب

9

$x=-1 \rightarrow a\log 2 - a + b\log 2 = 0 \Rightarrow a - a\log 2 = b\log 2 \rightarrow a(1-\log 2) = b\log 2 \Rightarrow$

$\frac{b}{a} = \frac{1-\log 2}{\log 2} = \frac{1}{\log 2} - 1 \Rightarrow (\sqrt{2})^{\frac{1}{\log 2}-1} = 2^{\frac{1}{2}(\frac{1}{\log 2}-1)} = 2^{\frac{1}{2}\log 2 - \frac{1}{2}}$

10

$\rightarrow \frac{1}{\log 2} = \log_2^{10}$ ، $2^{\log_2^{10}} = 10 \Rightarrow 2^{\frac{1}{2\log 2}} = \sqrt{10} \rightarrow 2^{\frac{1}{2\log 2} - \frac{1}{2}} = \sqrt{\frac{10}{2}} = \boxed{\sqrt{5}}$ ★ جواب

$\boxed{\sqrt{5}}$