نام و نام خانوادگی: [illegible]........................ پاسخنامه تشریحی تکلیف شماره .... کلاس ....

۱	$3^{Ax+B} = x^2 \to x=1 \to A+B=0 \to B=-1$ $x=3 \to 3A+B=2$ برخورد با محور y $\to x=0 \to 3^{B} \to 3^{-1} \to \frac{1}{3}$
۲	$2^{x+3} = 4^x + 15 \to 2^x \times 2^3 = 2^{2x} + 15 \xrightarrow{2^x = t} 8t = 15 + t^2 \to t=5,\ t=3$ $2^x = 3 \to \log_2^3 = x$ $2^x = 5 \to \log_2^5 = x$ $\xrightarrow{\text{مجموع}} \log_2^3 + \log_2^5 \to \log_2^{3\times5} = \log_2^{15}$
۳	$\log_{21}^{1323} = \log_{21}^{3} + 2$ $\log_{21}^{147} = \log_{21}^{7} + 1 \to \log_{21}^{3} + 2$ $7 \to \log_{21}^{21/3}$ $(\log_{21}^{3})^2 + (\log_{21}^{3} + 2)(\log_{21}^{3} + 2) \to (\log_{21}^{3})^2 + 4 - (\log_{21}^{3})^2 = 4$
۴	$x^2 - 2x + 1 \to (x-1)^2 \to 2\log(x-1) + 3\log(1-x) = 5$ $\log(x-1) = 1$ $\log(1-x) = 1$ $x-1 = 10$ $x = 11$ ✗ $1-x = 10 \to x = -9$ ✓ $\log_3^9 = 2$
۵	فیل و فنجان $\log_2^{(x^2+2x+4)(x-2)} = 3 \to \log_2^{(x^3-2^3)} = 3 \to x^3 - 2^3 = 2^3 \to x^3 = 16$ $\to \log_2^{16} = 4$

۶

$(x-2)^2=(2-x)^2$

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

$x=-8$

$\log_{\sqrt{2}}^{8}=6$

۷

$3^{x^2-2}=3^{4x} \to x^2-2=4x \to x=\frac{4+2\sqrt{6}}{2}$ ✓ , $x=\frac{4-2\sqrt{6}}{2}$ ✗

$2+\frac{2\sqrt{6}}{2} \to 2+\sqrt{6} \longrightarrow \log_6^{2+\sqrt{6}-2}=\log_6^{\sqrt{6}}=\frac{1}{2}$

۸

$\frac{\log_3^8}{\log_3^{18}} \to \frac{\log_3^{2\times4}}{\log_3^{2\times9}} \to \frac{\log_3^2+\log_3^2+\log_3^2}{\log_3^2+\cancel{\log_3^9}} = \frac{3\times\frac{5}{8}}{\frac{21}{\cancel{8}}} = \frac{15}{21} = \frac{5}{7}$

۹

$\log_{12}^6 \to \frac{\log_4^6}{\log_4^{12}} = \frac{\overset{0.8}{\cancel{\log_4^3}}+\overset{\frac{1}{2}}{\cancel{\log_4^2}}}{\underset{0.8}{\log_4^3}+\cancel{\log_4^4}\,1} = \frac{1.3}{1.8} = \frac{13}{18}$

۱۰

یکی از ریشه‌ها $=-1 \longrightarrow a\log 2+b\log 2-a=0 \to \log 2(a+b)=a \to \log 2=\frac{a}{a+b}$

$\frac{1}{\log 2}=\frac{a+b}{a} \to 1+\frac{b}{a}=\frac{1}{\log 2} \to \frac{b}{a}=\frac{1}{\log_{10}^2}-1 \to \frac{b}{a}=\log_2^{\overset{5\times2}{10}}-1$

$\frac{b}{a}=\log_2^2+\log_2^5-1$

$\frac{b}{a}=\log_2^5 \to (\sqrt{2})^{\log_2^5} \to 5^{\log_2^{\sqrt{2}}}=5^{\frac{1}{2}}=\sqrt{5}$