نام و نام خانوادگی ......الناهست اصفهانی...... پاسخنامه تشریحی تکلیف شماره ...۲۴... کلاس ..یازدهم ریاضی A..........

۱

$y=x^2 \to x=1 \Rightarrow y=1$

$\quad\;\; \to x=3 \Rightarrow y=9$

$f(x)=3^{Ax+B} \xrightarrow{x=1} 1=3^{A+B} \Rightarrow A+B=0$

$\qquad\qquad \xrightarrow{x=3} 9=3^{3A+B} \Rightarrow 3A+B=2$

$$\begin{cases} A+B=0 \\ 3A+B=2 \end{cases}$$

$2A=2 \Rightarrow A=1 \;,\; B=-1$

$f(x)=3^{x-1} \to$ تبدیل به صورت log $\Rightarrow f(0)=3^{-1}$ $\frac{1}{3}$

۲

$\log_2^{(4^x+15)}=x+3 \to 2^{(x+3)}=4^x+15 \to 2^x\times 8=2^{2x}+15 \xrightarrow{2^x=t} 8t=t^2+15 \to t^2-8t+15=0$

$\to (t-3)(t-5)=0 \Rightarrow t=3 \;,\; t=5 \to 2^x=3 \Rightarrow x=\log_2^3$

$\qquad\qquad\qquad\qquad\qquad\quad \to 2^x=5 \Rightarrow x=\log_2^5$

مجموع جواب‌ها $\Rightarrow \log_2^3+\log_2^5=\boxed{\log_2^{15}}$

۳

$(\log_{21}^3)^2+\log_{21}^{(147)}\log_{21}^{(1323)}=(\log_{21}^3)^2+\log_{21}^{(147)}\log_{21}^{(147\times 9)}=(\log_{21}^3)^2+\log_{21}^{147}(\log_{21}^{147}+2\log_{21}^3)=$

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

$\to (2\underbrace{\log_{21}^{21}}_{1})^2=4$

۴

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

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

$\log_3^{(-x)}=\log_3^9=2$

۵

$\log_2^{(x^2+2x+4)}+\log_2^{(x-2)}=3 \to \log_2^{(x^2+2x+4)(x-2)}=3 \to \log_2^{x^3-8}=3 \Rightarrow 2^3=x^3-8 \Rightarrow x^3=16 \Rightarrow$

$x=\sqrt[3]{16}$

$\log_{\sqrt[3]{2}}^x=\log_{\sqrt[3]{2}}^{\sqrt[3]{16}}=\log_{2^{\frac{1}{3}}}^{16^{\frac{1}{3}}}=\log_2^{16}=4$

۶

$\log(2-x)-\log\frac{1}{(x-2)^2}=3 \to \log(2-x)-\log(x-2)^{-2}=3 \to 3\log(2-x)=3 \to 2-x=10 \Rightarrow x=-8$

$\log_{\sqrt{2}}^{(-x)}=\log_{\sqrt{2}}^{8}=\log_{2^{\frac{1}{2}}}^{2^3}=6$

۷

$3^{x^2-2}=81^{x} \to 3^{x^2-2}=3^{4x} \Rightarrow x^2-2=4x \to x^2-4x-2=0 \qquad \Delta=16-4(-2)=24$

$x=\frac{4\pm\sqrt{24}}{2} \to \begin{cases} x=2+\sqrt{6} \\ x=2-\sqrt{6} \end{cases}$ غ ق ق

$\log_{6}^{(x-2)}=\log_{6}^{(2+\sqrt{6}-2)}=\log_{6}^{6^{\frac{1}{2}}}=\frac{1}{2}$

۸

$\log_{3}^{2}=\frac{5}{8} \to \log_{2}^{3}=\frac{8}{5}$

$\log_{18}^{8}=\frac{1}{\log_{8}^{18}}=\frac{1}{\frac{1}{3}\log_{2}^{18}}=\frac{1}{\frac{1}{3}\underbrace{(\log_{2}^{2}+\log_{2}^{3}+\log_{2}^{3})}_{1+\frac{8}{5}+\frac{8}{5}=\frac{21}{5}}}=\frac{1}{\frac{7}{5}}=\frac{5}{7}$

۹

$\log_{4}^{3}=0/8$

$\log_{12}^{6}=\frac{\log_{4}^{6}}{\log_{4}^{12}}=\frac{\log_{4}^{3}+\log_{4}^{2}}{\log_{4}^{3}+\log_{4}^{4}}=\frac{0/8+\frac{1}{2}}{0/8+1}=\frac{\frac{13}{10}}{\frac{18}{10}}=\frac{13}{18}$

۱۰

$(a\log 2)x^2+ax+b\log 2=0 \xrightarrow{x=-1} a\log 2-a+b\log 2=0 \to a\log 2+b\log 2=a \Rightarrow (a+b)\log 2=a \to$

$\log 2=\frac{a}{a+b} \to \log_{2}^{10}=\frac{a+b}{a} \Rightarrow \underbrace{\log_{2}^{2}}_{1}+\log_{2}^{5}=\frac{a+b}{\underbrace{a}_{1}} \Rightarrow \log_{2}^{5}=\frac{b}{a}$

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