نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲۴ ..... کلاس ..... B .....

۱

$f(1)=1 \Rightarrow 3^{A+B}$

$f(3)=3^2 \Rightarrow 3^{2A+B}$

$\Rightarrow A+B=0,\ 2A+B=2 \Rightarrow A=1,\ B=-1$

$f(x)=3^{x^2-1} \xrightarrow{x=0} f(0)=\frac{1}{3}$

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$\log_2^{4^x+15} = x+3 \rightarrow 4^x+15=2^{x+3} \rightarrow 2^{2x}+15=8\times 2^x$

$\xrightarrow{2^x=t} t^2-8t+15=0 \rightarrow (t-3)(t-5)=0$

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

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

$\alpha=\log_2^3+\log_2^5=\log_2^{15}$

۳

$(\log_{21}^3)^2+\log_2^{147}\log_{21}^{343}=(\log_{21}^3)^2+(\log_{21}^{441}-\log_{21}^3)(\log_{21}^{441}+\log_{21}^3)$

$=(\log_{21}^3)^2+(\log_{21}^{441})^2-(\log_{21}^3)^2=2^2=4$

۴

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

$\rightarrow \log^{-(x-1)^5}=5 \Rightarrow -x+1=10 \rightarrow x=-9$

$\log_3^9=2$

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$\log_2^{x^2+2x+5}+\log_2^{x-2}=3 \rightarrow \log_2^{x^3-8}=3$

$\rightarrow x^3-8=8 \rightarrow x^3=16 \rightarrow x=2^{\frac{4}{3}}$

$\Rightarrow \log_{2^{\frac{1}{4}}}^{2^{\frac{4}{3}}}=4$

۶

$\log^{\frac{1}{(x-2)^2}} - \log^{(x-2)^2} = 4 \rightarrow \log^{-(x-2)} + \log^{(x-2)^2} = 4$

$\rightarrow \log^{-(x-2)^2} = 4 \rightarrow -x+2 = 10 \rightarrow x = -8$

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

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$4^{x^2-2x} = 4^{4x} \rightarrow x^2-6x-2=0 \rightarrow (x-3)^2-9=0 \rightarrow x-3 = \pm 3$

$\rightarrow \log^{x-2}_{\sqrt{2}} 4 = \log_4 4 = \frac{1}{2}$

۸

$\log_{\sqrt{2}}^{2} = \frac{5}{8}$

$\log_{18}^{8} = \frac{\log^8}{\log^{18}} = \frac{3\log^2}{\log^2+\log^9} = \frac{15}{21} = \frac{5}{7}$

۹

$\log^4_3 = 0,8 \rightarrow \log^3_2 = 1,6$

$\log_{12}^{2} = \frac{\log^2_2}{\log^{12}_2} = \frac{1}{\log^4_2+\log^3_2} = \frac{2,5}{4,1} = \frac{13}{18}$

۱۰

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

$a(\log^2-1) + b\log^2 = 1 - \log^2+\log^5 \rightarrow \log^2-1 + \frac{b}{a}\log^2 \log^2+\log^5-2$

$\frac{b}{a} = \frac{\log^5}{\log^2} = \log^5_2 \rightarrow (\sqrt{2})^{\log^5_2} = 5^{\log^{\sqrt{2}}_2} = \sqrt{5}$