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

۲۰

۱ (۲)

$f(1)=1 = 3^{A+B}$
$f(3)=3^2 = 3^{2A+B}$
$\Rightarrow \begin{matrix} A+B=0 \\ 2A+B=2 \end{matrix} \Rightarrow A=1 , B=-1$

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

۲ (۲)

$\log_3^{4^x+15} = x+3 \rightarrow 4^x+15=3^{x+3} \rightarrow 4^x+15=3^x\times 27$

$\xrightarrow{3^x=t} t^2-27t+135=0 \rightarrow (t-9)(t-15)=0$

$t=9 \rightarrow 3^x=9 \rightarrow x=\log_3^9$
$t=15 \rightarrow 3^x=15 \rightarrow x=\log_3^{15}$

$\alpha=\log_3^9+\log_3^{15}=\log_3^{135}$ ✓

۳ (۲)

$(\log_{21}^3)^2+\log_3^{147}\log_{21}^{343} = (\log_{21}^3)^2+(\log_{21}^{441}-\log_{21}^3)(\log_{21}^{441}+\log_{21}^3)$

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

۴ (۲)

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

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

$\log_3^9=2$ ✓

۵ (۲)

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

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

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

۶ (۲)

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

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

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

۷ (۲)

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

$\rightarrow \log_{6}^{x-2} = \log_{6}^{\sqrt{6}} = \frac{1}{2}$ ✓

۸ (۲)

$\log_{2}^{32} = \frac{5}{8}$

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

۹ (۲)

$\log_{4}^{3} = 0,8 \rightarrow \log_{2}^{3} = 1,6$

$\log_{12}^{2} = \frac{\log_{2}^{2}}{\log_{2}^{12}} = \frac{1}{\log_{2}^{4}+\log_{2}^{3}} = \frac{1}{2+1,6} = \frac{1}{3,6} = \frac{10}{36} = \frac{5}{18}$ ✓

۱۰ (۲)

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

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

$\frac{b}{a} = \frac{\log^5}{\log^2} = \log_2^5 \rightarrow (\sqrt{2})^{\log_2^5} = 5^{\log_2^{\sqrt{2}}} = \sqrt{5}$ ✓