نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲۴ کلاس یازدهم بررسی .....

۱ (۲)

$f(x)=3^{Ax+B}$, $y=x^2$

$\begin{cases} x=1 \to 3^{A+B}=1 \to A+B=0 \\ x=2 \to 3^{2A+B}=9 \to 2A+B=2 \end{cases} \Rightarrow A=1 \quad B=-1$

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

۲ (۲)

$\log_2^{4^x+10} = x+2 \to 4^{x+2} = 4^x+10 \to 16\times 4^x = 4^x+10 \xrightarrow{4^x=t} t^2-16t+10=0$

$\Rightarrow (t-5)(t-2)=0 \begin{cases} t=2 \to 4^x=2 \to x=\log_4^2 \\ t=5 \to 4^x=5 \to x=\log_4^5 \end{cases}$

$\Rightarrow \log_4^2+\log_4^5=\log_4^{10}$ ✓

۳ (۲)

$\log_{21}^{147}=\log_{21}^{7\times 21}=\log_{21}^{\frac{21^2}{3}}=2-\log_{21}^3$

$\log_{21}^{1323}=\log_{21}^{21\times 63}=\log_{21}^{21^2\times 3}=2+\log_{21}^3$

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

۴ (۲)

$\log_3^{(x-1)^2}+\log_3^{(1-x)^3}=\log_3^{10} \to (1-x)^5=10 \to 1-x=10 \to x=-9$

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

۵ (۲)

$\log_2^{(x^2+2x+4)(x-2)}=\log_2^1 \to x^3+2x^2+4x-2x^2-4x-1=1$

$\to x^3-16=0 \to x=16^{\frac{1}{3}}$

$\Rightarrow \log_{2^{\frac{1}{3}}}^{16^{\frac{1}{3}}}=\log_{2^{\frac{1}{3}}}^{2^{\frac{4}{3}}}=\frac{\frac{4}{3}}{\frac{1}{3}}=4$ ✓

۶

$$\log_{x-2} - \log_{\frac{1}{(x-2)^2}} = \log_{10^2} \rightarrow (2-x)(x-2)^2 = 10^2$$

$$\rightarrow (2-x)^3 = 10^2 \rightarrow 2-x = 10 \rightarrow x = -8 \checkmark$$

$$\Rightarrow \log_{\sqrt{2}}^{(-8)} = \log_{2^{\frac{1}{2}}}^{2^4} = \underline{\underline{4}} \checkmark$$

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$$3^{x^2-2x} = 3^{4x} \rightarrow x^2 - 6x - 2 = 0 \rightarrow \begin{cases} x = \frac{6+\sqrt{24+8}}{2} = 3+\sqrt{6} \checkmark \\ x = \frac{6-\sqrt{24+8}}{2} = 3-\sqrt{6} \times \end{cases}$$

$$\log_4^{(x-2)} = \log_4^{1+\sqrt{6}-2} = \log_4^{\sqrt{6}} = \underline{\underline{\frac{1}{2}}} \checkmark$$

۷

$$\log_{12}^{8} = \frac{\log_3^8}{\log_3^{12}} = \frac{3\log_3^2}{\log_3^3 + \log_3^4} = \frac{\frac{7}{8} \times 3}{1 + \frac{7}{8}} = \frac{\frac{21}{8}}{\frac{15}{8}} = \frac{21}{15} = \underline{\underline{\frac{7}{5}}}$$

۹۰

$$\log_{12}^{6} = \frac{\log_2^6}{\log_2^{12}} = \frac{\log_2^3 + \log_2^2}{\log_2^3 + \log_2^4} = \frac{0/11 + 0/10}{0/10 + 1} = \frac{1/21}{1/10} = \underline{\underline{\frac{21}{10}}}$$

۱۰

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

$$\Rightarrow \frac{b}{a} = \frac{1-\log 2}{\log 2} = \frac{\log 5}{\log 2} = \log_2^5 = \log_2^{(\sqrt{2})^4} \log_2^5 = 4\log_{2^{\frac{1}{2}}}^{\sqrt{2}} = \underline{\underline{4\sqrt{5}}}$$