نام و نام خانوادگی ...[illegible]... پاسخنامه تشریحی تکلیف شماره ..۲۴.. کلاس ...یازدهم ریاضی A...

۲۰

۱ (۲)

$x=1 \to y=1 \,,\, x=3 \to y=9 \Rightarrow f(1)=3^{A+B}=1 \,,\, f(3)=3^{3A+B}=9$

$\to A+B=0 \,,\, 3A+B=2 \to A=1 \,,\, B=-1$

$f(0)=3^{B}=3^{-1}=\frac{1}{3}$ ✓

۲ (۲)

$\log_{2}^{(4^x+15)}=x+3 \to 2^{x+3}=4^{x}+15 \to 2^{x+3}=2^{2x}+15$

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

$2^x=3 \to x=\log_{2}^{3} \,,\, 2^x=5 \to x=\log_{2}^{5} \to \log_{2}^{5}+\log_{2}^{3}=\boxed{\log_{2}^{15}}$ ✓

۳ (۲)

$\left(\frac{\log_{7}^{3}}{\log_{7}^{21}}\right)^2+\frac{\log_{7}^{147}}{\log_{7}^{21}}\times\frac{\log_{7}^{1323}}{\log_{7}^{21}}=\left(\frac{\log_{7}^{3}}{1+\log_{7}^{3}}\right)^2+\frac{2+\log_{7}^{3}}{1+\log_{7}^{3}}\times\frac{2+3\log_{7}^{3}}{1+\log_{7}^{3}}$

$\xrightarrow{1+\log_{7}^{3}=t} \left(\frac{t-1}{t}\right)^2+\frac{t+1}{t}\times\frac{3t-1}{t}=\frac{4t^2}{t^2}=4$ ✓

۴ (۲)

$x^2-2x+1=(1-x)^2 \to \log(x^2-2x+1)+3\log(1-x)=5 \to 5\log(1-x)=5$

$\to \log(1-x)=1 \to 1-x=10 \to x=-9$ ✓

$\to \log_{3}^{-x}=\log_{3}^{9}=2$ ✓

۵ (۲)

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

$\to x=\sqrt[3]{16} \to \log_{\sqrt[3]{2}}^{x}=4$ ✓

۶

$$\log_{10}^{2-x} - \log_{10}^{\frac{1}{(x-2)^2}} = \log_{10}^{(2-x)(x-2)^2} = \log_{10}^{(2-x)^3} = 3 \rightarrow x = -8 \checkmark$$

$$\rightarrow \log_{\sqrt{2}}^{-x} = \log_{\sqrt{2}}^{8} = 4 \checkmark$$

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$$3^{x^2-2} = 81^{x} \rightarrow 3^{x^2-2} = 3^{4x} \rightarrow x^2-4x-2=0 \rightarrow x = \frac{4 \pm 2\sqrt{4}}{2} = 2 \pm \sqrt{4}$$

$$\xrightarrow{x>0} x = 2+\sqrt{4} \rightarrow \log_{4}^{x-2} = \log_{4}^{\sqrt{4}} = \frac{1}{2} \checkmark$$

۸

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

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$$\log_{12}^{4} = \frac{\log_{6}^{4}}{\log_{6}^{12}} = \frac{\log_{6}^{2}+\log_{6}^{3}}{\log_{6}^{2}+\log_{6}^{6}} = \frac{1,3}{1,8} = \frac{13}{18} \checkmark$$

۱۰

$$x=-1 \xrightarrow{} a\log 2 - a + b\log 2 = 0 \rightarrow (a+b)\log 2 = a \;,\; b\log 2 = a(1-\log 2)$$

$$\xrightarrow{\text{تقسیم}} \frac{b}{a} = \frac{1-\log 2}{\log 2} = \log_{2}^{5} \rightarrow (\sqrt{2})^{\frac{b}{a}} = \sqrt{2}^{\log_{2}^{5}} = 5^{\log_{2}^{\sqrt{2}}\frac{1}{2}}$$

$$= \sqrt{5} \checkmark$$