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

۱ (۲)

$f \to (1,1)-(2,3)$

$f(1)=1 \to 2^{A+B}=1 \to A+B=0$

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

$\Rightarrow A=1, B=-1 \to f(x)=2^{x-1}$

$\to f(0)=2^{0-1}=2^{-1}=\frac{1}{2}$ ✓

۲ (۲)

$\log_2^{4x+10} = x+2 \to 4^{x+5} = 2^{x+2} \to (2^x)^2 - 8\times 2^x + 15 = 0$

$\to (2^x-5)(2^x-3)=0 \to \begin{cases} 2^x-5=0 \to 2^x=5 \to x=\log_2^5 \\ 2^x-3=0 \to 2^x=3 \to x=\log_2^3 \end{cases}$

$\log_2^5 + \log_2^3 = \log_2^{15}$ ✓

۳ (۲)

$\log_{21}^{189} = \log_{21}^{9\times 21} = \log_{21}^9 + \log_{21}^{21} = 2\log_{21}^3 + \log_{21}^{21}$

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

$= (\log_{21}^3 + \log_{21}^{21})^2 = (\log_{21}^{63})^2 = (\log_{21}^{21})^2 = (2\log_{21}^{21})^2 = 4$ ✓

۴ (۲)

$\log(x^2-4x+1) + 2\log(1-x) = 0 \to \log(1-x)^2 + 2\log(1-x) = 0$

$2\log(1-x) + 2\log(1-x) \to \log(1-x)^2 = 1 \to 1-x=10 \to x=-9$

$\to \log_2^{9} = 2$ ✓

۵ (۲)

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

$\to \log_{\sqrt[3]{2}}^{\sqrt[3]{16}} = \log_2^{16} = 4$ ✓

۶ (۲)

$\log_{\frac{1}{10}}^{(x-2)^2}\left(\frac{1}{x-2}\right)=2 \rightarrow (x-2)^2=1000 \rightarrow x-2=-10$

$\rightarrow x=-8 \rightarrow \log_{\sqrt{2}}^{x^2}=\log_{\sqrt{2}}^{64}=12$ ✓

۸ (۲)

$(x-2)^m=x_2^m \rightarrow x_2=x-2 \rightarrow x^2-x_2^2=0 \quad x=\frac{1+\sqrt{81}}{2}$

$x=\frac{5\pm\sqrt{81}}{2}=\frac{5\pm9}{2} \quad x>2 \rightarrow x=7 \quad x=-2$ ✗

$\log_4^{x-2}=\log_4^{\sqrt{5}}=\frac{1}{2}$ ✓

۷ (۲)

$\log_{\sqrt{3}}^{x}=\frac{5}{2} \rightarrow x=3^{\frac{5}{2}}$

$\log_{\sqrt{7}}^{\frac{x^3}{7}}=\frac{3\log x-\log 7}{\frac{1}{2}\log 7}=\frac{3\log x-\log 7}{\log 7^{\frac{1}{2}}}=\frac{3\log_7 x-1}{\frac{1}{2}}=\frac{3\times\frac{5}{2}-1}{\frac{1}{2}}=\frac{13}{\frac{1}{2}}=26$ ✓

۹ (۲)

$\log_{12}^{4}=\frac{\log_4^4}{\log_4^{12}}=\frac{\log_4^4}{\log_4^{(3\times4)}}=\frac{\log_4^4}{\log_4^3+\log_4^4}=\frac{1}{\frac{\log_4^3}{\log_4^4}+1}=\frac{1}{\log_4^3+1}$

$=\frac{1}{\log_2^3+2}=\frac{1}{\log_2^{12}}=\frac{1}{\log_2^{3\times4}}=\frac{1}{\log_2^3+\log_2^4}=\frac{1}{\log_2^3+2}$ ✓

۱۰

$x=\frac{\pi}{3}$

$$x = -1 \rightarrow a\log r - a + b\log r = 0$$

$$b\log r = a(1 - \log r)$$

$$b\log r = a\log a \rightarrow \frac{b}{a} = \frac{\log a}{\log r} = \log_r a$$

$$(\sqrt{r})^{\log_r a} = a^{\log_r \sqrt{r}} = a^{\frac{1}{r}} = \boxed{\sqrt{a}}$$