نام و نام خانوادگی ...[illegible]... پاسخنامه تشریحی تکلیف شماره ...۲۴... کلاس ...یازدهم دختر B...

۱۸,۵

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$$3^2 = 3^{3A+B} \Rightarrow 2 = 3A+B \qquad \Rightarrow \begin{cases} 3A+B=2 \\ -A-B=0 \end{cases}$$

$$1^2 = 3^{A+B} \xRightarrow[3^0=1]{} 0 = A+B \qquad 2A = 2 \Rightarrow A=1 \Rightarrow B=-1 \Rightarrow f(x) = 3^{x-1}$$

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

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$$2^{x+3} = 4^x + 15 \Rightarrow 2^x \times 8 = (2^x)^2 + 15 \xRightarrow[t=2^x]{} t^2 - 8t + 15 = 0 \Rightarrow (t-3)(t-5) = 0$$

$$\Rightarrow \begin{cases} t_1 = 5 \Rightarrow 2^{x_1} = 5 \Rightarrow x_1 = \log_2^5 \\ t_2 = 3 \Rightarrow 2^{x_2} = 3 \Rightarrow x_2 = \log_2^3 \end{cases} \Rightarrow x_1 + x_2 = \log_2^5 + \log_2^3 = \boxed{\log_2^{15}}$$

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$$\left(\log_{21}^7 = \frac{1}{\log_7^{21}} = \frac{1}{1+\log_7^3} \;\Big/\; \log_{21}^3 = \frac{1}{\log_3^{21}} = \frac{1}{1+\log_3^7} = \frac{1}{1+\frac{1}{\log_7^3}} = \frac{1}{\frac{\log_7^3+1}{\log_7^3}} = \frac{\log_7^3}{1+\log_7^3} \right)''$$

$$(\log_{21}^3)^2 + \log_{21}^{3\times 7^2} \times \log^{3^3\times 7^2} = (\log_{21}^3)^2 + (1+\log_{21}^7)(2+\log_{21}^3) \xRightarrow[t=\log_7^3]{''}$$

$$\frac{t^2}{(t+1)^2} + \left(1+\frac{1}{1+t}\right)\left(2+\frac{t}{1+t}\right) = \frac{t^2}{(t+1)^2} + \left(\frac{t+2}{t+1}\right)\left(\frac{3t+2}{t+1}\right) = \frac{t^2+3t^2+2t+6t+4}{t^2+2t+1}$$

$$= \frac{4t^2+8t+4}{t^2+2t+1} = \frac{4\cancel{(t^2+2t+1)}}{\cancel{t^2+2t+1}} = \boxed{4}$$

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$$\log(x-1)^2 + \log(1-x)^3 = \log 10^5 \xRightarrow[(x-1)^2=(1-x)^2]{} \log(1-x)^2(1-x)^3 = \log 10^5$$

$$\Rightarrow (1-x)^5 = 10^5 \Rightarrow 1-x = 10 \Rightarrow x = -9 \Rightarrow \log_3^{-(-9)} = \log_3^9 = \boxed{2}$$

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

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

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$$\log \frac{2-x}{\frac{1}{(x-2)^2}} = \log 10^3 \xRightarrow{(x-2)^2=(2-x)^2} (2-x)^3 = 10^3$$

$$\Rightarrow 2-x = 10 \Rightarrow x = -8$$ ۶

$$\log_{\sqrt{2}}^{-x} = \log_{\sqrt{2}}^{-(-8)} = \log_{\sqrt{2}}^{8} = \log_{2^{\frac{1}{2}}}^{2^3} = \frac{3}{\frac{1}{2}} \log_2^2 = \boxed{6}$$

$$3^{x^2-2} = 3^{4x} \Rightarrow x^2-2 = 4x \Rightarrow x^2-4x-2=0 \Rightarrow \Delta = 16+8 = 24$$

$$\Rightarrow \begin{cases} x_1 = \frac{2\sqrt{6}+4}{2} = \sqrt{6}+2 & \text{ق ق} \\ x_2 = \frac{-2\sqrt{6}+4}{2} = -\sqrt{6}+2 & \text{غ ق ق} \ (\log_6^{(x-2)} = \log_6^{-\sqrt{6}} \rightarrow \text{غ ق ق}) \end{cases}$$ ۷

$$\log_6^{(\sqrt{6}+2-2)} = \log_6^{\sqrt{6}} = \boxed{\frac{1}{2}}$$

$$\log_{18}^{8} = \log_{18}^{2^3} = 3\log_{18}^{2} = \frac{3}{\log_2^{18}} = \frac{3}{\log_2^2+\log_2^9} = \frac{3}{1+2\log_2^3} = \frac{3}{1+2\times\frac{5}{8}} = \frac{3}{\frac{9}{4}}$$

$$= \boxed{\frac{4}{3}} \qquad \log_{18}^{8} = \frac{\log_3^8}{\log_3^{18}} = \frac{\log_3^{2^3}}{\log_3^{3^2}+\log_3^2} = \frac{3\log_3^2}{2+\log_3^2} = \frac{3\times\frac{5}{8}}{2+\frac{5}{8}} = \frac{15}{21} = \frac{5}{7}$$ ۸

$$\log_{12}^{6} = \frac{1}{\log_6^{12}} = \frac{1}{\log_6^6+\log_6^2} = \frac{1}{1+\frac{1}{\log_2^6}} = \frac{1}{1+\frac{1}{\log_2^2+\log_2^3}} = \frac{1}{1+\frac{1}{1+\frac{8}{5}}}$$

$$= \frac{1}{1+\frac{1}{\frac{13}{5}}} = \frac{1}{1+\frac{5}{13}} = \frac{1}{\frac{18}{13}} = \boxed{\frac{13}{18}}$$ ۹

$$\log_4^3 = \frac{1}{2}\log_2^3 = \frac{8}{10} \Rightarrow \log_2^3 = \frac{8}{5}$$

$$(a\log 2)x^2 + ax + b\log 2 = 0 \xRightarrow[\div a\log 2]{} x^2 + \frac{x}{\log 2} + \frac{b}{a} = 0 \xRightarrow[\text{یکی از جواب‌ها است}]{x=-1} 1 - \frac{1}{\log 2} + \frac{b}{a} = 0$$

$$\Rightarrow \frac{b}{a} = \frac{1}{\log 2} - 1 = \log_2^{10} - 1 = \log_2^{10} - \log_2^2 = \log_2^5$$ ۱۰

$$(\sqrt{2})^{\frac{b}{a}} = (\sqrt{2})^{\log_2^5} = 5^{\log_2^{\sqrt{2}}} = 5^{\frac{1}{2}} = \boxed{\sqrt{5}}$$