$\log^{(2-x)} - \log \frac{1}{(x-2)^2} = 2 \rightarrow \frac{2x}{\frac{1}{(x-2)^2}} = 10^2 \rightarrow (x-2)^2 \times (2-x)(x-2)^{x-1} = 10^2 \rightarrow (x-2)^{x+1} = 10^2$

$x-2 = -10 \rightarrow x = -1$

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

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

$x = 2 \pm \sqrt{6}$ (ج) $x > 2$

$\sqrt{2+\sqrt{6}}$

$\times \; 2-\sqrt{6}$

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

$\log_2^2 = \frac{5}{8} \rightarrow \frac{1}{\log_2^2} = \frac{5}{8} \rightarrow \log_{10}^{32} = \frac{8}{5}$ (ج)

$\log_{10}^{18} = \frac{\log_2^8}{\log_2^{18}} = \frac{3}{\log_2^1 + \log_2^{2^2}} = \frac{3}{1+2\log_2^2} = \frac{3}{1+\frac{8}{5} \times 2} = \frac{3}{1+\frac{16}{5}} = \frac{\frac{3}{1}}{\frac{21}{5}} = \frac{5}{7}$

$\log_4^2 = \frac{8}{10} \rightarrow \log_2^2 = \frac{10}{8} \rightarrow 2\log_2^2 = \frac{10}{8} \rightarrow \log_2^2 = \frac{10}{16} = \frac{5}{8}$

$\log_{12}^{6} = \frac{\log_2^6}{\log_2^{12}} = \frac{\log_2^{2 \times 3}}{\log_2^{2^2 \times 3}} = \frac{\log_2^2 + \log_2^3}{\log_2^{2^2} + \log_2^3} = \frac{1+\frac{5}{8}}{1+\frac{10}{8}} = \frac{\frac{13}{8}}{\frac{18}{8}} = \frac{13}{18}$ (ج)

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

$\rightarrow (1+\frac{b}{a})\log^2 = 1 \rightarrow 1 + \frac{b}{a} = \frac{\log^{10}}{\log^2} = \log_2^{10} \rightarrow \frac{b}{a} = \log_2^{10} - 1$ (ج)

$\frac{b}{a} = \log_2^{10} - \log_2^2 + 1 = \log_2^5 - 1 + 1 \rightarrow \frac{b}{a} = \log_2^5$

$\Rightarrow \sqrt{2}^{\frac{b}{a}} = \sqrt{2}^{\log_2^5}$

$\rightarrow 5\log_2^{\sqrt{2}} = 5^{\frac{1}{2}} = \sqrt{5}$

نام و نام خانوادگی: ... کلاس ۲۴ — گروه یازدهم دختر A — ۲۰

$f(x)=3^{Ax+B}$ ، $y=x^2$ ، $x_1=1$ ، $x_2=3$

$x=1 \to y=1 \Rightarrow x=1 \to f(x)=1=3^{A+B} \to A+B=0$

$x=3 \to y=9 \Rightarrow x=3 \to f(x)=9=3^{3A+B} \to 3A+B=2$ $\Big\}\ 2A=2 \to A=1$, $B=-1$ ۱

$f(x)=3^{x-1} \to x=0 \Rightarrow 3^{-1}=\boxed{\frac{1}{3}}$ ← نقطه‌ی تلاقی تابع f با محور y ها

$\log_2^{(4^x+15)}=x+3 \to \log_2^{(4^x+15)}=\log_2^{2^{(x+3)}} \Big\} \to 2^x \times 2^3$

$2^x=t \to t^2+15=t\times 8 \to t^2-8t+15=0 \to (t-3)(t-5)=0$ ، $t=5$ ، $t=3$ ۲

$\to 2^x=5 \to x_1=\log_2^5$

$\to 2^x=3 \to x_2=\log_2^3$

جمع جواب‌ها: $\log_2^3+\log_2^5=\boxed{\log_2^{15}}$

$(\log_{21}^{3})^2+\log_{21}^{(147)}\log_{21}^{1323}$ ...

① $\log_{21}^{147}=\log_{21}^{21}+\log_{21}^{7}=1+(\log_{21}^{21}-\log_{21}^{3})=2-\log_{21}^{3}$

② $\log_{21}^{1323}=2\log_{21}^{21}+\log_{21}^{3}=2+\log_{21}^{3}$ ۳

$\to (\log_{21}^3)^2+(2-\log_{21}^3)\times(2+\log_{21}^3)=(\log_{21}^3)^2+4-(\log_{21}^3)^2=\boxed{4}$

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

$(x^2-2x+1)\times(1-x)^3=10^5 \to (x-1)^2\times(x-1)^3\times -1=10^5 \to -(x-1)=10 \to x-1=-10$ ۴

$\boxed{x=-9}$ $\log_3^9=\boxed{2}$

$\log_2^{(x^2+2x+4)}+\log_2^{x-2}=3$
$\log_2^8$

$\to (x^2+2x+4)(x-2)=8 \to (x+2)^2(x-2)=8 \to x^3-8=8 \to x^3=16 \to x=\sqrt[3]{16}$ ۵

$\log_{\sqrt[3]{2}}^{x}=\frac{\frac{1}{3}}{\frac{1}{3}}\log_2^{16}=\boxed{4}$