نام و نام خانوادگی ...ملیکا ...... پاسخنامه تشریحی تکلیف شماره ۲۴ کلاس ...یازدهم هنر...

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

$y = x^2 \xrightarrow{x=1} y=1 \to 1 = 3^{A+B} \to A+B=0$

$\xrightarrow{x=3} y=9 \to 9 = 3^{3A+B} \to 3A+B=2$

$\Rightarrow 2A = 2 \to A=1 \ , \ B=-1$

$\Rightarrow f(x) = 3^{x-1} \xrightarrow[x=0]{\text{نقطه تلاقی با محور } y} \boxed{f(0) = 3^{0-1} = 3^{-1} = \frac{1}{3}}$

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$\log_2 (4^x+15) = x+3 \to \underbrace{2^{(x+3)}}_{8\times 2^x} = \underbrace{4^x}_{(2^x)^2} + 15 \xrightarrow{2^x = t} 8t = t^2+15 \to t^2-8t+15=0$

$\to (t-3)(t-5)=0 \to t=3 \to 2^x=3 \to x_1 = \log_2 3$

$\quad t=5 \to 2^x=5 \to x_2 = \log_2 5$

$x_1+x_2 = \log_2 3 + \log_2 5 = \boxed{\log_2 15}$

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$(\log_{21} 3)^2 + \underbrace{\log_{21}(\overset{21\times 7}{147}) \log_{21}(1323)}_{} \to 21\times 21\times 3$

$(1+\log_{21} 7)(2+\log_{21} 3) \to (2-\log_{21} 3)(2+\log_{21} 3) = 4-(\log_{21} 3)^2$

$\log_{21} 7 = \log_{21} \frac{21}{3} = 1-\log_{21} 3$

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

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

$\to 1-x = 10 \to \boxed{x=-9}$

$\log_3 (-x) = \log_3 -(-9) = \boxed{\log_3 9 = 2}$

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

$\to x^3-8 = 8 \to x^3 = 16 \to x = 2^{\frac{4}{3}}$

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

$\log(2-x)-\log\frac{1}{(x-2)^2}=3 \rightarrow \log\frac{(2-x)}{\frac{1}{(x-2)^2}}=\log(2-x)^3=3 \rightarrow (2-x)^3=10^3 \rightarrow 2-x=10 \rightarrow x=-8$ $\log_{\sqrt2}(-x)=\log_{\sqrt2}-(-8)=\boxed{\log_{\sqrt2}8=6}$	۶
$3^{x^2-2}=81^x \rightarrow 3^{x^2-2}=3^{4x} \rightarrow x^2-2=4x \rightarrow x^2-4x-2=0$ $\rightarrow x=\frac{4\pm\sqrt{16+8}}{2}=2\pm\sqrt6$ (غ ق ق) ; $x-2>0 \rightarrow x>2$ $\Big\} \rightarrow \log_6(x-2)=\log_6(2+\sqrt6-2)=\log_6\sqrt6=\boxed{\frac12}$	۷
$\log_3 2=\frac58 \rightarrow \log_2 3=\frac85$ $\log_{12}8=\frac{1}{\log_8 12}=\frac{1}{\log_8 4+\log_8 3}=\frac{1}{\frac23\log_2 3+\frac13}=\frac{1}{\frac23\times\frac85+\frac13}=\frac{1}{\frac{21}{15}}=\boxed{\frac57}$	۸
$\log_4 3=0.8$ $\log_{12}6=\frac{\log_4 6}{\log_4 12}=\frac{\log_4 2+\log_4 3}{\log_4 3+\log_4 4}=\frac{\frac12+0.8}{0.8+1}=\frac{1.3}{1.8}=\boxed{\frac{13}{18}}$	۹
$(a\log2)x^2+ax+b\log2=0$ (یکی از ریشه‌ها ۱) $\rightarrow a\log2+b\log2=a \rightarrow b\log2=a(1-\log2)$ $\rightarrow \frac ba=\frac{1-\log2}{\log2}=\frac{\log\frac{10}{2}}{\log2}=\frac{\log5}{\log2}=\log_2 5$ $(\sqrt2)^{\frac ba}=(\sqrt2)^{\log_2 5}=5^{\log_2\sqrt2}=5^{\frac12}=\boxed{\sqrt5}$	۱۰