نام و نام خانوادگی ..امین اسماعیلی.. پاسخنامه تشریحی تکلیف شماره ..۲۴.. کلاس ..A..

۱

$1 = \mu^{A+B}$ $\quad A+B=0 \quad -A=B$

$9 = \mu^{2A+B} \Rightarrow \mu^{2A} = 9 \quad 2A=2 \Rightarrow A=1, B=-1$

$\mu^{An+B} = \mu^{n-1} \xrightarrow[n=0]{\text{تا آخر}} \mu^{-1} = \frac{1}{\mu}$

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$\kappa^{n} + 10 = \mu^{n+2} \qquad \mu^{2n} + 10 = \mu^{n+2} = \mu^{n} \times \mu^{2}$

$(\mu^n)^2 + 10 = \mu^n \times \mu^2 \rightarrow (\mu^n)^2 + 10 = \mu^n \times 9 \qquad \mu^n = t$

$t^2 + 10 = 9t \Rightarrow \begin{matrix} t=2 \\ t=5 \end{matrix} \rightarrow \mu^n = 2, 5 \Rightarrow n = \log_\mu^2, \log_\mu^5$

۳

$(\log_{21}^3)^2 + \log_{21}^{147} \log_{21}^{343} \rightarrow \log_{21}^{(21\times7)} \times \log_{21}^{(343\times3)} = (\log_{21}^3 + \log_{21}^7) \times \log_{21}^{(343\times3)}$

$\log_{21}^{(343\times3)} = \log_{21}^{(21)^2} + \log_{21}^3 = 2 + \log_{21}^3 \quad (1+\log_{21}^2)(2+\log_{21}^3) =$

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

$\log_{21}^{(21\times7)} = 1 + \log_{21}^7$

۴

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

$2\log(1-n) = 0 \Rightarrow \log 1-n = 1 \Rightarrow 1-n = 10 \rightarrow n = -9$

$\log_3^{-n} = \log_3^9 = 2$

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

$n^3 - 8 = 8 \rightarrow n^3 = 16 \Rightarrow n = \sqrt[3]{2^4} \Rightarrow \log_{\sqrt[3]{2}}^{n} = 4\log_2^2 = 4$

$\log_{2-x} - \log \frac{1}{(x-1)^2} = \log_{(2-x)} - \log_{\frac{1}{(2-x)^2}} = \log_{(2-x)} - \log_{(2-x)^{-2}} = \log_{\frac{2-x}{(2-x)^2}}$

$= \log_{(2-x)^3}^{10} = 3 \rightarrow 2-x = 10 \rightarrow x = -8$ ۴

$\log_{\sqrt{2}}^{-x} = \log_{\sqrt{2}}^{8} = \log_{2^{\frac{1}{2}}}^{2^3} = 4\log_2^2 = 4$

$3^{x^2-2} = 3^{4x} \rightarrow x^2 - 2 = 4x \rightarrow x^2 - 4x - 2 = 0 \rightarrow x = \frac{4 \pm \sqrt{24}}{2}$

$\begin{cases} x = 2+\sqrt{6} \rightarrow \log_6^{x-2} = \log_6^{\sqrt{6}} = \frac{1}{2} \\ x = 2-\sqrt{6} \rightarrow x-2 > 0 \end{cases}$ ۲

$\log_{18}^{8} = \frac{\log_{24}^{8}}{\log_{24}^{18}} = \frac{\log_{3^2}^{2^3}}{\log_{3^2}^{2} + \log_{3^2}^{9}} \xrightarrow{\log_{3^2}^{2} = \frac{3}{4}} \frac{\frac{3}{4}}{\frac{1}{2}\left(\frac{3}{4}+2\right)} = \frac{\frac{15}{4}}{\frac{11}{4}}$

$\frac{15}{11} = \frac{5}{7}$ $\qquad \frac{1}{2}(\log_{3^2}^{2} + \log_{3^2}^{9})$ ۸

$\log_{12}^{9} = \frac{\log_{4}^{9}}{\log_{4}^{12}} = \frac{\log_{4}^{2} + \log_{4}^{3}}{\log_{4}^{3} + \log_{4}^{3}} = \frac{\frac{1}{2} + \frac{3}{4}}{1 + \frac{3}{4}} = \frac{13}{14}$ ۹

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

$\log 2^{a+b} = \log 10^{9} = 0 \rightarrow \log \frac{2^{a+b}}{10^{9}} = 0 \rightarrow \frac{2^{a+b}}{10^{9}} = 1$ ۱۰

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

$\sqrt{2}\log_2^5 = 5^{\log_2^{\sqrt{2}}}$