نام و نام خانوادگی ....علی صفری.... پاسخنامه تشریحی تکلیف شماره ..۲۳.. کلاس ..یازدهم تجربی A....

$\log_n m = a \longrightarrow m = n^a$

$\log_{mn} m^2 n = b \xrightarrow{m=n^a} \log_{n^{a+1}} n^{2a+1} = b \longrightarrow n^{(a+1)\times b} = n^{2a+1}$ ۱

$\longrightarrow b = \frac{2a+1}{a+1} = \frac{2a+2-1}{a+1} = 2 - \frac{1}{a+1} \xrightarrow{a>0} 0<\frac{1}{a+1}<1 \to 1<2-\frac{1}{a+1}<2 \to [b]=1$

الف) $y=\sqrt{\frac{x}{\log_{\frac12} x}} \to \frac{x}{\log_{\frac12} x}\ge 0 \to \underbrace{\begin{array}{ccc} 0 & & 1 \\ - & + & - \end{array}}_{x>0}$ → ریشه مخرج $\xrightarrow{x>0} D_f=(0,1)$

ب) $y=\frac{\log_4 (x^2-x-2)}{\sqrt{x^2-1}+1} \longrightarrow \begin{cases} x^2-x-2>0 & \begin{array}{ccc} -1 & & 2 \\ + & - & + \end{array} \\ x^2-1\ge 0 \to x^2\ge 1 \to x\ge 1 \text{ یا } x\le -1 \end{cases} \longrightarrow D_f=(-\infty,-1)\cup(2,+\infty)$ ۲

$2\log_x a + \log_a \sqrt{x} = 2 \longrightarrow \log_x a^2 + \frac{1}{2}\log_a x = 2 \to \log_x a^2 + \log_{a^2} x = 2$

$\xrightarrow{\log_x a^2 = t} t+\frac{1}{t} = 2 \longrightarrow t^2-2t+1=0 \longrightarrow t=1 \longrightarrow \log_x a^2 = 1$ ۳

$\xrightarrow{x=9} \log_9 a^2 = 1 \longrightarrow a^2=9 \longrightarrow \begin{cases}\boxed{a=+3} \checkmark \\ a=-3 \quad X \quad . \; a>0\end{cases}$

$\left(\log \frac{5}{3}\right)x^2 + (\log 9)x - \log 15 = 0$ $\qquad \log 3 = 0.4 , \log 2 = 0.3 , \log 5 = 1-\log 2 = 0.7$

$(\log 5 - \log 3)x^2 + (2\log 3)x - (\log 3 + \log 5) = 0 \longrightarrow 0.3x^2 + 0.8x - 1.1 = 0$ ۴

$\xrightarrow{a+b+c=0} x=1$ یا $x=\frac{-1.1}{0.3} = -\frac{11}{3} \longrightarrow \left|1-\left(-\frac{11}{3}\right)\right| = \frac{14}{3}$

$\log_2 7 = 2.8 \longrightarrow \log 7 = 2.8\log 2 \quad , \quad \log_5 2 \simeq 0.5 \longrightarrow \log 5 \simeq 2\log 2$

$\longrightarrow \log_{14} 10 = \frac{\log 10}{\log 14} = \frac{\log 5 + \log 2}{\log 7 + \log 2} = \frac{3\log 2}{3.8\log 2} = \frac{3}{3.8}$ ۵

روش دوم: $\log_{14} 10 = \frac{\log_2 10}{\log_2 14}$

$= \frac{\log_2 5 + \log_2 2}{\log_2 7 + \log_2 2} = \frac{2+1}{2.8+1} = \frac{3}{3.8}$

$\log_3 5 = 1.5 \rightarrow \log 5 = 1.5 \log 3 \quad \} \quad \log_2 3 = 1.6 \rightarrow \log 2 = \frac{5}{8} \log 3$

$\log_{15} 6 = \frac{\log 6}{\log 15} = \frac{\log 2 + \log 3}{\log 3 + \log 5} = \frac{\frac{13}{8}\log 3}{2.5 \log 3} = \frac{13}{20}$ 6

$\log_8 18 = m = \log_8 9 + \log_8 2 = \log_8 9 + \frac{1}{3} = m \rightarrow \log_8 9 = m - \frac{1}{3}$

$\rightarrow \frac{2}{3}\log_2 3 = m - \frac{1}{3} \rightarrow \log_2 3 = \frac{3}{2}m - \frac{1}{2} \rightarrow \log_4 12 = \log_4 3 + \log_4 4$ 7

$= \frac{1}{2}\log_2 3 + 1 = \frac{3}{4}m - \frac{1}{4} + 1 = \frac{3}{4}m + \frac{3}{4} = \frac{3m+3}{4}$

$\left(\frac{2}{5}\right)^{2x-1} = \left(\frac{125}{8}\right)^{x^2} \rightarrow \frac{2^{2x-1}}{5^{2x-1}} = \frac{5^{3x^2}}{2^{3x^2}} \rightarrow 2^{3x^2+2x-1} = 5^{3x^2+2x-1}$

$\rightarrow 3x^2 + 2x - 1 = 0 \rightarrow \underset{\times}{x=-1} , \underset{\checkmark}{x=\frac{1}{3}} \xrightarrow{9x+1>0} x = \frac{1}{3} \rightarrow \log_8^{9x+1} = \log_8 4$ 8

$= \frac{2}{3}\log_2 2 = \frac{2}{3}$

$\log_2 3 = a \qquad \log_2 b = 2(1+a) \rightarrow \frac{1}{2}\log_2 b = 1+a$

$\rightarrow \frac{1}{2}\log_2 b = \log_2 2 + \log_2 3 \rightarrow \frac{1}{2}\log_2 b = \log_2 6 \rightarrow \log_2 b = 2\log_2 6$ 9

$\rightarrow \log_2 b = \log_2 36 \rightarrow b = 36 \rightarrow \log(3b-8) = \log(100) = 2$

$-4ax^2 + bx + \frac{1}{2}c = 0 \rightarrow \frac{1}{\alpha+\beta} = \frac{4a}{b} = \log 4 \quad , \quad 2a = c+b \quad \boxed{b = 2a - c}$

$\rightarrow \frac{4a}{2a-c} = \log 4 \rightarrow \frac{2a-c}{4a} = \log_4 10 \rightarrow \frac{1}{2} - \frac{c}{4a} = \log_4 10 \rightarrow \frac{c}{4a} = \frac{1}{2} - \log_4 10$ 10

$= \log_4 2 - \log_4 10 = \log_4 \frac{1}{5} \rightarrow \boxed{\frac{c}{a} = 4\log_4 \frac{1}{5}} \rightarrow \left(\frac{1}{\sqrt[8]{2}}\right)^{\frac{c}{a}} = \left(2^{-\frac{1}{8}}\right)^{\frac{c}{a}} = \left(2^{\log_4 \frac{1}{5}}\right)^{-\frac{1}{2}}$

$= \left((0.2)^{\frac{1}{2}}\right)^{-\frac{1}{2}} = (0.2)^{-\frac{1}{4}} = 5^{\frac{1}{4}} = \sqrt[4]{5}$