نام و نام خانوادگی ......ترنم ایران...... پاسخنامه تشریحی تکلیف شماره ..۲۳.. کلاس ......A......

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$\log_n m = a$

$\log_{mn} m^2 n = b \rightarrow b = \frac{\log_n m^2 n}{\log_n mn} \Rightarrow \frac{\log_n m^2 + \cancel{\log_n n}^{\,1}}{\log_n m + \cancel{\log_n n}^{\,1}} = \frac{2\log_n m + 1}{\log_n m + 1} = \frac{2a+1}{a+1}$

$b = \frac{2(a+1)-1}{a+1} = 2 - \underbrace{\frac{1}{a+1}}_{\text{بین ۰ و ۱}} \Rightarrow 2 - \underset{\text{بین ۰ و ۱}}{x} = 1 < b < 2 \Rightarrow [b] = 1$

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الف) $y = \sqrt{\frac{x}{\log_{1/2} x}} \longrightarrow$ کل عبارت ≥ 0 و $\log_{1/2} x > 0$

$\longrightarrow x > 0$

$\longrightarrow \log_{1/2} x \neq 0 \rightarrow x \neq (1/2)^0 \rightarrow x \neq 1 \rightarrow x < 1/2$

$\Rightarrow \boxed{x \geq 0}$

ب) $y = \frac{\log_4 (x^2 - x - 2)}{\sqrt{x^2-1}+1}$

$(x^2-x-2) > 0 \rightarrow (x-2)(x+1) > 0$ $\quad$ $-1 \quad 2$: $+ \; - \; +$ $\rightarrow x > 2 \;,\; x < -1$

مخرج همیشه ≥ 1 ← $\sqrt{x^2-1}+1 \longrightarrow x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \geq 1 \;,\; x \leq -1$

$\Rightarrow D = (-\infty, -1) \cup (2, +\infty)$

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$2\log_x a + \log_a \sqrt{x} = 2 \longrightarrow 2\log_9 a + \log_a 3 = 2 \quad \overset{t}{\log_3 a} + \log_a 3 = 2$

$x = 9$

$\underbrace{2\log_9 a}_{2(\frac{1}{2}\log_3 a) = \log_3 a} \qquad \underbrace{\log_a 3}_{\frac{1}{\log_3 a}}$

$\Rightarrow t + \frac{1}{t} = 2 \longrightarrow \frac{t^2+1}{t} = 2 \rightarrow t^2 - 2t + 1 = 0 \rightarrow \boxed{t=1}$ و $\log_3 a = 1 \rightarrow a = 3^1 \Rightarrow \boxed{a=3}$

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$\log 2 = 0/3$ و $\log 3 \simeq 0/4 \quad \rightarrow \log 5 = \log 10 - \log 2 = 1 - 0/3 = 0/7$

$\log 9 \rightarrow \log 3^2 \rightarrow 2\log 3 = 2(0/4) = 0/8$

$\underbrace{[\log \frac{5}{3}]}_{\log 5 - \log 3 = 0/7 - 0/4 = 0/3} x^2 + (\log 9)x - \log 15 = 0$

$-\log 15 = -(\log 3 + \log 5) = -1/1 \quad \times 10$,

$3x^2 + 8x - 11 = 0 \xrightarrow{a+b+c=0} x_1 = 1$ و $\underbrace{x_2 = \frac{c}{a}}_{-\frac{11}{3}} \Rightarrow 1 - (-\frac{11}{3}) = \frac{3+11}{3} = \frac{14}{3}$

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$\log_2 7 = 2/8$ و $\log_5 2 = 0/5 \xrightarrow[\text{می‌کنیم}]{\text{برعکس ②}} \frac{1}{\log_5 2} = \frac{1}{0/5} = 2 = \log_2 5$

$\log_{14} 10 = ? \rightarrow \frac{\log_2 10}{\log_2 14} = \frac{\log_2 (2\times5)}{\log_2 (2\times7)} = \frac{\log_2 2 + \log_2 5}{\log_2 2 + \log_2 7} = \frac{1+2}{1+2/8} = \frac{3}{3/8}\,\frac{\times 10}{\times 10} = \frac{30}{38} = \frac{15}{19} \simeq 0/78$

$\log_3 5 = 1.5$, $\log_2 3 = 1.6 \to \frac{1}{\log_2 3} = \frac{1}{1.6} \overset{\times 10}{=} \frac{10}{16} = 0.625 = \log_3 2$

$\log_{15} 6 = ? \to \frac{\log_3 6}{\log_3 15} = \frac{\log_3 2 + 1}{\log_3 5 + 1} = \frac{0.625+1}{1.5+1} = \frac{1.625}{2.5}\frac{\times 1000}{\times 1000} = \frac{1625}{2500} = \frac{65}{100} = 0.65$ ۶

$\log_8 18 = m \to \log_{2^3} 18 = m \Rightarrow \frac{1}{3}\log_2 18 = m \to \underbrace{\log_2 18}_{\log_2 2\times 3^2} = 3m$

$\log_2 2\times 3^2 = 3m \to \log_2 2 + \log_2 3^2 = 3m$

$1 + 2\log_2 3 = 3m$

$2\log_2 3 = 3m-1$

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

$\log_4 12 \to \frac{\log_2 12}{\log_2 4} = \frac{\log_2 12}{2} = \frac{\log_2 2^2 + \log_2 3}{2}$, $12 \to 2^2\times 3$ ۷

$\to \frac{2 + \log_2 3}{2} = \frac{2 + \left(\frac{3m-1}{2}\right)}{2} = \frac{\frac{4+3m-1}{2}}{2} = \frac{3m+3}{4}$

$(0.4)^{2x-1} = \left(\frac{125}{8}\right)^{x^2}$, $\frac{4}{10} = \frac{2}{5}$, $\frac{5^3}{2^3} = \left(\frac{5}{2}\right)^3$

$\Rightarrow \left(\frac{2}{5}\right)^{2x-1} = \left(\left(\frac{5}{2}\right)^3\right)^{x^2} \to \underbrace{\left(\frac{2}{5}\right)^{2x-1}}_{\left(\frac{5}{2}\right)^{-(2x-1)}} = \left(\frac{5}{2}\right)^{3x^2}$

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

$\log_8 (9x+1)$

$\to 3x^2 = -2x+1$

$\to \log_8 4 \to \log_{2^3} 2^2 = \frac{2}{3}\log_2 2 = \frac{2}{3}$ ۸

$\to 3x^2 + 2x - 1 = 0$

$\to x_1 = -1$, $x_2 = \frac{1}{3}$

* Log با ⊖ تعریف نشد. ⇐ غ ق ق ✗ ق ق ✓

$\log_{\cancel{4} \to 2^2} b = \frac{2}{3}(1+a)$, $\log_2 3 = a$

$\log (3b-8)$ $\to \frac{1}{\cancel{2}}\log_2 b = \frac{2}{\cancel{2}}(1+a) \to \log_2 b = \underbrace{2(1+a)}$

$2(1+\log_2 3) \to 2(\log_2 6) \Rightarrow \log_2 6^2$ ۹

$\to \log (108-8) = \log 100 = 2$

$\log_2 b = \log_2 6^2 = \log_2 36 \to \boxed{b = 36}$

$-4ax^2 + bx + \frac{1}{2}c = 0 \to \frac{1}{S} = \log 4$, $b + c = 2a \to \frac{2a \pm b + c}{a} \Rightarrow 2 = \frac{b+c}{a}$

$\left[\frac{1}{\sqrt[8]{2}}\right]^{\frac{c}{a}} \Rightarrow 2^{-\frac{1}{8} \times -4\log_2 5} = 2^{\log_2 \sqrt[4]{5}} = \sqrt[4]{5}$

$\Rightarrow S = -\frac{b}{-4a} = \frac{b}{4a} \to \log 4 = \frac{1}{\frac{b}{4a}} \Rightarrow \log 4 = \frac{4a}{b} \Rightarrow \cancel{2}\log 2 = \frac{\cancel{4}^{2}a}{b} \to \frac{1}{2}\times\frac{1}{\log_2 10} = \frac{a}{b}$

$\frac{b}{a} = 2\log_2 10$, $\frac{c}{a} = 2 - 2\log_2 10 \Rightarrow 2 - 2(\log_2 5 + \log_2 \cancel{2}) \Rightarrow c/a = -2\log_2 5$