نام و نام خانوادگی حسین بیان شاری نوران

پاسخنامه تشریحی تکلیف شماره ۲۳ کلاس یازدهم س B

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$\log_n m = a \;/\; \log_{mn} m^2 n = b = \dfrac{\log_n m^2 n}{\log_n mn} = \dfrac{\log_n m^2 + \log_n n}{\log_n m + \log_n n} = \dfrac{2\log_n m + 1}{\log_n m + 1} = b$

$b = \dfrac{2a+1}{a+1}, \quad a > 0 \;\Rightarrow\; 1 < b < 2 \;\Rightarrow\; [b] = 1$

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الف) $y = \sqrt{\dfrac{x}{\log_{\frac{1}{2}} x}} = \sqrt{\left(x \times \log_x \frac{1}{2}\right)}$

$x > 0 \,,\; x \neq 1$

برای اینکه حاصل $\log < 0$

II $x > 1$

$D_f = (0,1)$

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

I) $x^2 - x - 2 > 0 \rightarrow$ (−1 , 2)

II) $x^2 - 1 \geq 0 \Rightarrow$ (−1 , 1)

I ∩ II) $= (-\infty, -1) \cup (2, +\infty)$

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$2\log_{\frac{x}{9}} a + \log_a \sqrt[3]{x} = \log_3 a + \log_a 3 = 2 \longrightarrow t + \dfrac{1}{t} = 2 \Longrightarrow$

$\dfrac{t^2+1}{t} = 2 \Rightarrow \dfrac{t^2 - 2t + 1}{t} = 0 \Rightarrow t^2 - 2t + 1 \Rightarrow t = 1$

$\log_3 a = 1 \Rightarrow a = 3$

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$\left(\log \frac{5}{3}\right) x^2 + (\log 9)\, x - \log 15$ $\qquad |x_2 - x_1| = 2{,}1$

$\log 5 - \log 3 - \log 5 - \log 3 + 2\log 3 = 0$ (جمع ضرایب) $\Longrightarrow$

$x_1 = 1$

$x_2 = -\log_{\frac{5}{3}} 15 = -\left(\dfrac{\log 5 + \log 3}{\log 5 - \log 3}\right) = -1{,}1$

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$\log_{14} 10 = \dfrac{\log_2 10}{\log_2 14} = \dfrac{1 + \log_2 5}{1 + \log_2 7} = \dfrac{1+2}{1+2{,}8} = \dfrac{3}{3{,}8}$

$$\log_{15}^{6} = \frac{\log_3^6}{\log_3^{15}} = \frac{1+\log_3^2}{\log_3^5+1} = \frac{1+\frac{1}{2}}{1.5+1} = \frac{\frac{3}{2}}{\frac{5}{2}} = \frac{3}{5}$$

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$$\log_8^{18} = m \Rightarrow \frac{1}{3}\log_2^{18} = m \Rightarrow \log_2^{18} = 3m = \log_2^9 + \log_2^2 = 2\log_2^3 + 1$$

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

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$$\log_4^{12} = 2\log_2^{12} = 2\left(\log_2^4 + \log_2^3\right) = 2\left(2 + \frac{3m-1}{2}\right) = 3m+3$$

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

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$$3x^2+2x-1 = 0 \begin{cases} x = \frac{1}{3} \\ x = -1 \text{ غ ق ق} \end{cases}$$

$$\log_8^{(9x+1)} \Rightarrow \log_8^4 = \frac{2}{3}$$

$$\frac{1}{2}\log_2^b = \frac{2}{3}(1+\log_2^3) \Rightarrow \log_2^b = 2+2\log_2^3 \Rightarrow$$

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$$b = 36 \Rightarrow \log_2^{(3(36)-1)} = \log_2^{107} = 2$$

$$\frac{b}{4a} = 8 \Rightarrow \frac{1}{8} = \frac{4a}{b} = 2\log_2^2 \Rightarrow \frac{a}{b} = \log_2^{\sqrt{2}}$$

$$\frac{c+b}{2} = a \Rightarrow \frac{c}{a} + \frac{b}{a} = 2 \rightarrow \frac{c}{a} = 2 - \frac{b}{a} = 2 - \log_2^{\sqrt{2}} = \log_2^{\frac{4}{\sqrt{2}}}$$

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$$\left(\frac{1}{\sqrt{2}}\right)^{\log_{\sqrt{2}}^{\frac{4}{10}}} \Rightarrow 2^{\frac{-1}{8}\log_2^{\frac{4}{10}}} = \left(\frac{4}{10}\right)^{-\frac{1}{8}} = \sqrt[8]{\frac{5}{2}}$$