Subject: * یازدهم دفتر B * تکلیف شماره ۲۳ * ریاضی

Date: Year: Month: Day:

①

$n^a = m$

$\log_{mn}^{m^2 n} = b \rightarrow \log_{n^a \times n}^{n^{2a} \times n} = b \rightarrow \log_{n^{a+1}}^{n^{2a+1}} = b \rightarrow \frac{2a+1}{a+1} \cancel{\log_n^n} = b \rightarrow \left[\frac{2a+1}{a+1}\right] = [b]$

$\left[\frac{a+a+1}{a+1}\right] = [b] \rightarrow 1 + \left[\frac{a}{a+1}\right] = [b] \xrightarrow[a>0]{} 0 < \frac{a}{a+1} < 1 \rightarrow [b] = 1$

②

الف) $y = \sqrt{\frac{x}{\log_{\frac{1}{2}}^{x}}}$

$x > 0$

$\log_{1/2}^{x} \neq 0 \rightarrow x \neq 1$

$D_f = (0, 1)$

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

$\sqrt{x^2-1} \neq -1$ ✓ ①

$x^2 - 1 \geq 0$

$(x-1)(x+1) \geq 0$ ③

$x^2 - x - 2 > 0$

$x = -1, 2$ ②

$① \cap ② \cap ③ : D_f = (-\infty, -1) \cup (2, +\infty)$

③

$2\log_x^a + \frac{1}{2}\log_a^x = 2 \rightarrow \log_a^x = A$

$\frac{2}{A} + \frac{1}{2}A = 2 \xrightarrow{\times 2A} 4 + A^2 - 4A = 0 \rightarrow A^2 - 4A + 4 = 0 \rightarrow (A-2)^2 = 0 \rightarrow A = 2$

$\log_a^9 = 2 \rightarrow a^2 = 9 \rightarrow a = 3$

④

$\log 5/3 = \log 5 - \log 3 = 1 - \log 2 - \log 3 = 1 - 0/3 - 0/4 = 1 - 0/7 = 0/3$

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

$\log 15 = \log(3 \times 5) = \log 3 + \log 5 = \log 3 = 1 - \log 2 = 0/4 + 1 - 0/3 = 1/1$

$\rightarrow 0/3x^2 + 0/8x - 1/1 = 0 \xrightarrow{\times 10} 3x^2 + 8x - 11 = 0 \begin{cases} x = 1 \\ x = -11/3 \end{cases} \rightarrow 1 - (-11/3) = 14/3$

⑤

$\log_5^2 \times \log_2^7 = 0/5 \times 2/8 \Rightarrow \log_5^7 = 1/4$

$\log_{14}^{10} = \frac{\log_5^2 + \log_5^5}{\log_5^2 + \log_5^7} = \frac{0/5+1}{0/5+1/4} = \frac{1/5}{1/9} = \frac{15}{19}$

parsian

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$$\log_{۱۵}^{۶} = \frac{\log ۶}{\log ۱۵} = \frac{\log_{۳}^{۲} + \log_{۳}^{۳}}{\log_{۳}^{۵} + \log_{۳}^{۳}} = \frac{\frac{۵}{۸}+۱}{\frac{۳}{۲}+۱} = \frac{\frac{۱۳}{۸}}{\frac{۵}{۲}} = \frac{\frac{۱۳}{۸}}{\frac{۲۰}{۸}} = \frac{۱۳}{۲۰} = ۰/۶۵$$ ۶

$$\frac{۱}{۳}\log_{۲}^{۱۸} = \frac{۱}{۳}\left(۱ + ۲\log_{۲}^{۳}\right) = m \longrightarrow \log_{۲}^{۳} = \frac{۳m-۱}{۲}$$ ۷

$$\log_{۴}^{۱۲} = \frac{۱}{۲}\log_{۲}^{۱۲} = \frac{۱}{۲}\left(۲ + \log_{۲}^{۳}\right) = \frac{۱}{۲}\left(\frac{۴}{۲} + \frac{۳m-۱}{۲}\right) \rightarrow \frac{۳m+۳}{۴} = \frac{۳}{۴}(m+۱)$$

$$\left(\frac{۴}{۱۰}\right)^{۲n-۱} = \left(\left(\frac{۵}{۲}\right)^{۳}\right)^{x۲} \longrightarrow \left(\frac{۲}{۵}\right)^{۲n-۱} = \left(\frac{۵}{۲}\right)^{۳n^۲}$$ ۸

$$\left(\frac{۵}{۲}\right)^{۱-۲n} = \left(\frac{۵}{۲}\right)^{۳n^۲} \rightarrow ۳n^۲ = ۱-۲n \rightarrow ۳n^۲+۲n-۱=۰ \begin{cases} n=\frac{۱}{۳} \\ n=-۱ \text{ غ ق ق} \end{cases}$$

$$\log ۹(۱/۳)+۱ = \log_{۸}^{۴} : \log_{۲^۳}^{۲^۲} = \frac{۲}{۳}\log_{۲}^{۲} = \frac{۲}{۳}$$

$$\log_{۸}^{b} = \frac{۲}{۳}\left(۱+\log_{۳}^{۲}\right) \rightarrow \log_{۸}^{b} = \frac{۲}{۳}\log_{۲}^{۶} \rightarrow \log_{۸}^{b} = \log_{۸}^{۳۶} \rightarrow b = ۳۶$$ ۹

$$= \log_{۱۰}^{۳\times۳۶-۸} \Rightarrow \log_{۱۰}^{۱۰۰} = ۲$$

$$S = \frac{-b}{-۴a} = \frac{b}{۴a} \Rightarrow \log ۴ = \frac{b}{۴a} \rightsquigarrow \frac{a}{b} = \frac{\log ۴}{۴} = \frac{۲\log ۲}{۴} = \frac{\log ۲}{۲}$$ ۱۰

$$۲a = b+c \longrightarrow \frac{۲a}{b} = ۱+\frac{c}{b} \Rightarrow \frac{a}{b} = \frac{\log ۲}{۲} \rightsquigarrow ۲\left(\frac{\log ۲}{۲}\right) = ۱+\frac{c}{b}$$

$$\rightarrow \frac{c}{b} = -۱+\log ۲ \longrightarrow \frac{c}{a} = \frac{-۱+\log ۲}{\frac{\log ۲}{۲}} \rightarrow \frac{c}{a} = \frac{\log ۲ - \log ۱۰}{\frac{۱}{۲}\log ۲} =$$

$$\frac{\log \frac{۲}{۱۰}}{\frac{۱}{۲}\log ۲} = \frac{\log\frac{۱}{۵}}{\frac{۱}{۲}\log ۲} \rightarrow \frac{\log\frac{۱}{۵}}{\log\sqrt{۲}} \Rightarrow \log_{\sqrt{۲}}^{\frac{۱}{۵}} \rightarrow \left(\frac{۱}{\sqrt{۲}}\right)^{\frac{c}{a}} \rightarrow \left(\frac{۱}{۵}\right)^{\log_{\sqrt{۲}}^{\frac{۱}{\sqrt{۲}}}} \rightarrow$$

$$= \left(\frac{۱}{۵}\right)^{-۱/۴} = \sqrt[۴]{۵}$$

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