انگان لاده

۱) $\log_n^m = a \to \frac{\log m}{\log n} = a$

$b = \log_{mn}^{m^2 n} = \frac{2\log m + \log n}{\log m + \log n} = \frac{2a+1}{a+1} = 1 + \frac{a}{a+1}$ ۱،...

$\to [b] = 1$

۱

۲) الف) $x > 0$ ، $\frac{1}{2} > 0$ ✓ ، $\frac{1}{2} \neq 0$ ✓

$\frac{x}{\log_{\frac12}^{x}} \geq 0$ ، $\log_{\frac12}^{x} \neq 0$ ، $\boxed{x \neq 1}$

x		۰		۱	
	+		−		+

نتیجه = $x > 1$ ، $\boxed{x \geq 1}$

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$\to \sqrt{x^2-1} + 1 = 0$ دامنه R

$\sqrt{x^2-1} \neq -1$

آیا ۲ ؟ صورت مثبت است،

۳) عبارت را برحسب $\log_x^a$ مرتب می‌کنیم.

$2(\log_x^a)^2 + \frac{1}{2} - 2\log_x^a = 0$ عبارت را در ۲ ضرب می‌کنیم

$4(\log_x^a)^2 + 1 - 4\log_x^a = 0$

$(2\log_x^a - 1)^2 = 0$

$\log_9^a = \frac{1}{2}$ ، $a = 9^{\frac12}$ ، $\boxed{a = 3}$

۱

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۴) $0 = b + a + c$ ، $x = 1$ ،

$x = \frac{-c}{a} \Rightarrow \frac{-(\log 5 + \log 3)}{\log 5 - \log 2} \simeq 0$

۱

بین اعداد ۲:

$|1 - 0| \simeq 1$

۵) $\log_5^2 \times \log_2^7 = \log_5^7 \Rightarrow 2{,}8 \times 0{,}5 = 1{,}4$

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$\log_{14}^{10} = \frac{1}{\log_{10}^{14}} \Rightarrow \frac{1}{\log_{10}^7 + \log_{10}^2} \Rightarrow \frac{1}{\frac{1}{\log_7^{10}} + \frac{1}{\log_2^{10}}} \Rightarrow \frac{1}{\frac{1}{\log_7^2 + \log_7^5} + \frac{1}{\cancel{\log_2^2} + \log_2^5}} \Rightarrow$

$\frac{1}{\frac{1}{\frac{1}{\log_2^7} + \frac{1}{\log_5^7}} + \frac{1}{1 + \cancel{\log_2^5}}} = \frac{1}{\cancel{\frac{10}{34}} + \frac{1}{34}} = \frac{24}{34} \Rightarrow \boxed{\frac{21}{34}}$

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$\log_{15}^{6} = \frac{1}{\log_6^5+\log_6^3} \Rightarrow \frac{1}{\frac{1}{\log_5^2+\log_5^3}+\frac{1}{\log_2^5+\log_2^2}} = \frac{1}{\frac{1}{\frac{1}{2.4}+\frac{1}{1.5}}+\frac{1}{\frac{1}{1.6}+1}} =$

$\frac{10.14}{15.6} = \boxed{0.65}$

$\log_2^3 \times \log_3^5 = \log_2^5 \Rightarrow 1.5 \times 1.6 = 2.4$

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$\log_{2^3}^{9\times 2} = \log_{2^3}^{3^2} + \log_{2^3}^{2} = \frac{2}{3}\log_2^3 + \frac{1}{3}\cancel{\log_2^2} = m$

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

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

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

$2x-1 = -3x^2$

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

$x = \frac{1}{3}, -1$

غیرقابل قبول

$\log_8^{\left(9\left(\frac{1}{3}\right)^2+1\right)} = \log_8^4 = \frac{2}{3}\cancel{\log_2^2} = \frac{2}{3}$

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$\frac{1}{3}\log_2^{b} = \frac{2}{3}(1+\log_2^3) \longrightarrow \log_2^b = 2\log_2^6 = \log_2^{36} \longrightarrow \underline{b=36}$

$\log_{10}^{108-8} = 2$

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$\alpha+\beta = \frac{b}{4a}$ $\quad \frac{b}{4a} = \log_{10}^4$ $\quad \frac{b}{a} = 4\times\log_{10}^4 = 4(2\log_{10}^2) =$

$8\log_{10}^2$ $\quad a = \frac{b+c}{2}$ $\quad b+c = 2a$ $\quad \frac{b}{a}+\frac{c}{a} = 2$ $\quad \frac{c}{a} = 2-\frac{b}{a} \Rightarrow$

$2-8\log_{10}^8$

$2^{-\frac{1}{8}(2-8\log 2)} \Rightarrow 2^{-\frac{1}{4}+\log_{10}^2}$

۱۰)

$$a=\frac{b+c}{2}\rightarrow b=2a-c\rightarrow \frac{1}{x_1+x_2}=\frac{1}{S}=\frac{4a}{b}=\frac{4a}{2a-c}=2\log^{2}$$

$$\rightarrow \frac{2a}{2a-c}=\log^{2}\xrightarrow{\text{معکوس}}\frac{2a-c}{2a}=\log_2^{10}\rightarrow 1-\log_2^{10}=\frac{c}{2a}\rightarrow 2-\log_2^{100}=\frac{c}{a} \quad (1)$$

$$\left(\frac{1}{\sqrt[8]{2}}\right)^{\frac{c}{a}}=\left(2^{-\frac{1}{8}}\right)^{\frac{c}{a}}=\left(2^{\frac{c}{a}}\right)^{\frac{-1}{8}}\xrightarrow{(1)}\left(2^{2-\log_2^{100}}\right)^{\frac{-1}{8}}$$

$$\left(\frac{2^{2}}{2^{\log_2^{100}}}\right)^{\frac{-1}{8}}=\left(\frac{4}{100}\right)^{\frac{-1}{8}}=(25)^{\frac{1}{8}}=\sqrt[4]{5}$$

۲ الف)

$$\frac{x}{\log_{\frac{1}{2}}^{x}}\geq 0\rightarrow \log_2^{x}<0\rightarrow x<2^{0}=1\rightarrow \begin{cases}x>0\\ x<1\end{cases}\rightarrow D=(0,1)$$

۲ ب)

$$\sqrt{x^2-1}\rightarrow(-\infty,-1]\cup[1,+\infty) \quad (1)$$

$$\log_4^{x^2-x-2}\rightarrow x^2-x-2>0\rightarrow(-\infty,-1)\cup(2,+\infty) \quad (2)$$

$$\xrightarrow{(1)\cap(2)}(-\infty,1)\cup(2,+\infty)$$

۴)

$$\log^{5}=0.7 \qquad \log^{9}=0.8 \qquad \log^{15}=1.1 \qquad \log^{\frac{5}{3}}=0.3$$

$$\rightarrow 0.3x^2+0.8x-1.1\rightarrow\begin{cases}x_1=1\\ x_2=\dfrac{-1.1}{0.3}\end{cases}\rightarrow x_1-x_2=\frac{14}{3}$$

۵)

$$\frac{\log_2^{5}+\log_2^{2}}{\log_2^{7}+\log_2^{2}}=\frac{2+1}{2.8+1}=\frac{15}{19}$$