پاسخ نامه

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،۰۰

$\to [b] = 1$

۲) الف) $x > 0$ ، $\frac{1}{2} > 0$ ، $\frac{1}{2} \neq 0$ ، $\frac{x}{\log_{\frac{1}{2}}^{x}} \geq 0$ ، $\log_{\frac{1}{2}}^{x} \neq 0$ $\boxed{x \neq 1}$

x	0		1	
	+	−		+

در نتیجه $x > 1$ ، $\boxed{x \geq 1}$

$\to \sqrt{x^2-1} + 1 = 0$ دامنه R

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

صورت جذر همیشه مثبت است.

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

$2(\log_x^a)^2 + \frac{1}{2} - 2\log_x^a = 0$

عبارت را در ۲ ضرب می‌کنیم

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

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

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

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۴) $0 = b + a + c$ ، $x = 1$ ،

$x = \frac{-c}{a} \Rightarrow \frac{-(\log 5 + \log 3)}{\log 5 - \log 6} \simeq 0$

بین اعداد صحیح:

$|1 - 0| \simeq 1$

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

$\log_{14}^{10} = \frac{1}{\log_{10}^{14}} \Rightarrow \frac{1}{\log_{10}^{7} + \log_{10}^{2}} \Rightarrow$

$\frac{1}{\frac{1}{\log_7^{10}} + \frac{1}{\log_2^{10}}} \Rightarrow \frac{1}{\frac{1}{\log_7^2 + \log_7^5} + \frac{1}{\log_2^2 + \log_2^5}} \Rightarrow$

$\frac{1}{\frac{1}{1 + \frac{1}{\log_2^7}} + \frac{1}{\frac{1}{\log_5^7} + \log_7^5}} = \frac{1}{\frac{1}{1+\frac{1}{2{,}8}}+\frac{1}{\frac{1}{1{,}4}+1}} = \frac{1}{\frac{14}{34} + \frac{1}{34}} = \frac{34}{34} = \frac{14}{34}$

$\boxed{\frac{21}{11}} =$

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$$\log_{15}^{6} = \frac{1}{\log_6^5 + \log_6^3} \Rightarrow \frac{1}{\frac{1}{\log_5^2 + \log_5^3} + \frac{1}{\log_3^2 + \log_3^3}} = \frac{1}{\frac{1}{\frac{1}{2.4} + \frac{1}{1.5}} + \frac{1}{\frac{1}{1.6} + 1}} =$$

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

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

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

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

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

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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

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

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

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

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

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

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

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

a