

$$\log_n^m = a \rightarrow n^a = m$$

$$\log_{mn}^{mn} = b \xrightarrow{n^a = m} \log_{n^a \cdot n}^{(n^a)^n} = \log_{n^{a+1}}^{n^{a+1}} \rightarrow \frac{a+1}{a+1} \log_n^n \rightarrow \frac{a+1}{a+1} = b$$

$$a > 0 \Rightarrow \frac{a+1+0}{a+1} = \frac{a}{a+1} + 1 = 1 \Rightarrow [1, \infty) = 1 \checkmark$$

$[b] = ?$

الف) $y = \sqrt{\frac{x}{\log_{\frac{1}{4}} x}} \rightarrow \frac{x}{\log_{\frac{1}{4}} x} \geq 0, x \neq 0 \xrightarrow{x > 0} \frac{x+1}{x} \geq 0 \Rightarrow \frac{1}{x} \geq -1 \Rightarrow x \geq -1 \Rightarrow D_f = (0, \infty) \checkmark$

ب) $\frac{\log_f (x^2 - x - 2)}{\sqrt{x^2 - 1} + 1} \xrightarrow{\text{شرایط}} \begin{cases} x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) > 0 \\ x^2 - 1 > 0 \rightarrow x^2 > 1 \end{cases} \Rightarrow \begin{cases} x > 2 \\ x < -1 \end{cases}$

$D_f = (-\infty, -1) \cup (2, +\infty) \checkmark$

$$2 \log_n^a + \log_a^{\sqrt{x}} = 2 \rightarrow 2 \log_n^a + \frac{1}{\sqrt{x}} \log_a^x = 2$$

$x=9 \Rightarrow \frac{2}{\log_n^9} + \frac{1}{3} \log_a^9 = 2 \xrightarrow{\text{تغییر متغیر}} \log_a^9 = t \rightarrow \frac{2}{t} + \frac{1}{3} t = 2 \rightarrow \frac{1}{3} t^2 - 2t + 2 = 0$

$\Delta = 4 - 4 = 0 \rightarrow t = 2 \rightarrow \log_a^9 = 2 \Rightarrow a^2 = 9 \Rightarrow a = 3 \checkmark$

$\log_2 2 = 0.3, \log_3 3 = 0.4 \rightarrow \text{اختلاف} = \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{b^2 - 4ac}}{|a|} = \frac{\sqrt{(2 \log_2^3)^2 + 4(\log_2^3 - \log_3^3)(\log_2^3 + \log_3^3)}}{|a|}$

$(\log_2^3)^x + (\log_3^3)^x - \log_3^3 = 0 \rightarrow \begin{cases} \log_2^3 = 2 \log_3^3 \\ \log_3^3 = \log_2^3 - \log_3^3 \end{cases} \Rightarrow \log_2^3 = \log_3^3 \Rightarrow \log_2^3 = \log_3^3 = 1 - 0.3 = 0.7$

$\Rightarrow \log_2^3 = \log_3^3 = 0.7 \checkmark$

$\log_2^3 = 0.18, \log_3^3 = 0.15 \rightarrow \log_{15}^{10} = \frac{\log_2^3 + \log_3^3}{\log_2^3 + \log_3^3} = \frac{\log_2^3}{\log_2^3} = \log_{15}^{10}$

$\log_{15}^{10} = ? \Rightarrow c = 2 \rightarrow \frac{1 + \log_2^3}{1 + \log_3^3} = \frac{1 + 0.15}{1 + 0.18} = \frac{1.15}{1.18} = \frac{115}{118} = \frac{15}{19} \checkmark$

* این سوال نیز مانند سوال ۵ حل می شود *

$$\lg^{\omega} \mu = 1, \omega$$

$$\lg y^w = 1,4$$

$$y_{10}^4 = 8.$$

$$\Rightarrow \frac{\frac{\omega}{\lambda} + \frac{1}{\lambda}}{\frac{v}{y} + \frac{v}{y}} = \frac{\frac{1v}{\lambda}}{\frac{\omega}{y}} = \frac{1v \times y}{\lambda \times \omega} = \frac{1v}{y_0} = 0.4\omega \quad \checkmark$$

$$\frac{lg_{\mu}^{\mu} + lg_{\nu}^{\nu}}{lg_{\mu}^{\mu} + lg_{\nu}^{\nu}} = \frac{\frac{1}{1,4} + 1}{1,2 + 1}$$

$$y^m = m$$

$\gamma_1 = m$
 $\gamma_1 \rightarrow \text{if } \gamma_1$

$$dy_F^{IV} = \frac{1}{m} = m$$

$$\lambda^m = 1 \xrightarrow{\psi^m} \psi^m = 1 \xrightarrow{\psi} \psi^{m-1} = 1 \Rightarrow \begin{cases} \psi^r = 1 \\ \psi = \psi^{m-1} \end{cases} \xrightarrow{\psi^{m-1}} \psi^{m-1} = \psi^{m-1}$$

$$\Rightarrow \text{مبلغ} = x \Rightarrow Fx = v_{m-1} + F \Rightarrow x = \frac{v_{m-1} + F}{F} = \frac{v}{F}(m+1) \quad \checkmark$$

$$(y/x)^{y_{x-1}} = \left(\frac{1/y}{1/x}\right)^{y_{x-1}} \Rightarrow \left(\frac{y}{x}\right)^{y_{x-1}} = \left(\left(\frac{x}{y}\right)^{-1}\right)^{y_{x-1}} \rightarrow \left(\frac{y}{x}\right)^{y_{x-1}} = \left(\left(\frac{y}{x}\right)^{-1}\right)^{y_{x-1}} \Rightarrow \left(\frac{y}{x}\right)^{y_{x-1}} = \left(\frac{y}{x}\right)^{-y_{x-1}}$$

$$\Rightarrow y_{m-1} = -y_m \rightarrow y_m + y_{m-1} = 0 \rightarrow x = \frac{-1 \pm \sqrt{1+1}}{1} = \frac{-1 \pm \sqrt{2}}{1}$$

$$\log_a = \dots \Rightarrow m = \frac{-x \pm f}{9} < \frac{-1 \pm \sqrt{1-4 \cdot 9 \cdot (-1)}}{18} \rightarrow \log_a (9x+1) \xrightarrow{x=1/4} \log_a^f = \log_{a^f} a^f$$

$$\Rightarrow \frac{y}{x} \log_y y = \frac{y}{x} \quad \checkmark$$

$$\log_y y = a$$

$$\begin{aligned} & \text{If } y_r = a \\ & \text{If } y_r = \frac{1}{r}(1+a) \end{aligned} \quad \begin{aligned} & \rightarrow y_{r^*}^b = \frac{1}{r^*} y_r^b = \frac{r}{r^*} (1+a) \Rightarrow b = r^{\frac{r}{r^*} (1+a)} = r^{\frac{r}{r^*}} \times r^{ra} = r^{\frac{r}{r^*}} \times r^{ra} \end{aligned}$$

$$y_A^b = \frac{P}{P} (1+a) \Rightarrow P^{Ka} = P^{Ly_P^K} \rightarrow P^{Ka} \times F = P^{Ly_P^K} \times F = Q^{Ly_P^K} \times F = Q \times F = RQ$$

$$\log(\psi^b - 1) = 8 \quad \rightarrow \quad \log(\psi^x \psi^y - 1) = \log(10^8 - 1) = \log 10^8 = 8 \quad \checkmark$$

$$-f am' + bmx + \frac{1}{r}c = 0$$

$$-f \ln x + bx + \frac{1}{f} C = 0 \quad \xrightarrow{f} \quad \frac{1}{-\frac{b}{f}} = \frac{fa}{b} = \ln x^f \xrightarrow{\div f} \frac{a}{b} = \frac{\ln x^f}{f} = \frac{1}{f} \ln x^f$$

$$\frac{1}{d+\beta} = \frac{1}{2} \log^f \frac{-a}{-fa} \quad \frac{r_a}{b} = 1 + \frac{c}{b} \rightarrow \frac{r_a}{b} = \frac{1}{f} \log^r = 1 + \frac{c}{b}$$

$$a = \frac{b+c}{r} \rightarrow \begin{cases} \frac{a}{b} = \frac{\log r}{r} \\ \frac{c}{b} = \log r - 1 \end{cases} \rightarrow \frac{c}{a} = \frac{\log r - 1}{\frac{\log r}{r}} = \frac{\log r - \log 1}{\frac{1}{r} \log r} = \frac{\log \frac{r}{1}}{\log \sqrt{r}} = \log \frac{1}{\sqrt{r}}$$

$$\hookrightarrow \left(\frac{1}{\sqrt[N]{\omega}}\right) g_{\sqrt{r}}^{\frac{1}{\sqrt{r}}} \rightarrow \left(\frac{1}{\omega}\right) g_{\sqrt{r}}^{\frac{1}{\sqrt[N]{\omega}}} = \left(\frac{1}{\omega}\right)^{-\frac{1}{N}} g_r^{\frac{1}{r}} = \left(\frac{1}{\omega}\right)^{-\frac{1}{N}} = \omega^{\frac{1}{N}} = \sqrt[N]{\omega} \quad \checkmark$$

ابری سوال 4 ←

$$\begin{cases} \lg^2 = 0,3 \\ \lg^3 = 0,4 \\ \lg^4 = 0,5 \end{cases}$$

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$$\sqrt{f(\cancel{(\lg^3)^2} + (\lg^4)^2 - \cancel{(\lg^2)^2})}$$

$$|\lg^4 - \lg^3|$$

$$\Rightarrow \frac{\sqrt{f(0,5)^2}}{|0,5 - 0,4|} = \frac{\sqrt{f \times 0,25}}{0,1} = \frac{5 \times 0,5}{0,1} = \frac{2,5}{0,1} = \frac{25}{1} \quad \checkmark$$