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مهدی کاظمی گروه پسران B

① ۲

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

$\frac{2a+1}{a+1} = b = \frac{2a+2-1}{a+1} = 2 - \frac{1}{a+1} \Longrightarrow 1 < b < 2 \rightarrow [b] = 1$

② — ۳

$2\log_n^9 + \log_a^{\sqrt{n}} = 2 \qquad n = 9 \qquad a = ?$

$2\log_9^9 + \log_a^{\sqrt{9}} = 2. \qquad \underbrace{2\log_{3^2}^{9}}_{} + \log_a^3 = 2$ ②

$\log_3^9 + \log_a^3 = 2$

$\log_a^3 = 1 \rightarrow a = 3 \Longleftarrow \frac{1}{\log_a^3} + \log_a^3 = 2$

$\log 2 = 0{,}3 \qquad \log^3 = 0{,}4 \qquad \underbrace{(\log \tfrac{5}{3})}_{0{,}3} n^2 + \underbrace{(\log^9)}_{0{,}8} n - \underbrace{\log^{15}}_{1{,}1} = 0$ ④

$\log \frac{5}{3} = \log^5 - \log^3 \longrightarrow 0{,}7 - 0{,}4 = 0{,}3$ ②

$\log^5 = \log\frac{10}{2} = \log^{10} - \log^2 = 1 - 0{,}3 = 0{,}7$

$\log^9 = 2\log^3 = 0{,}8 \qquad \log^{15} = \log^5 + \log^3$

$0{,}7 + 0{,}4 = 1{,}1$

$0{,}3n^2 + 0{,}8n - 1{,}1 = 0$

$n^2 + 0{,}8n - 0{,}33 = 0 \longrightarrow (n + 1{,}1)(n - 0{,}3) = 0$

$-\frac{11}{3} = -\frac{1{,}1}{0{,}3} \qquad \frac{0{,}3}{0{,}3} = 1$

$1 - \left(-\frac{11}{3}\right) = \frac{3+11}{3} = \frac{14}{3}$ اختلاف ۲ ریشه

۵ (۲)

$\log_{2}^{7}=2.8 \qquad \log_{5}^{2}=0.5 \qquad \log_{14}^{10}=?$

$\log_{14}^{10}=\log_{14}^{2}+\log_{14}^{5}$

$\log_{14}^{2}=\frac{\log_{5}^{2}\to 0.5}{\log_{5}^{14}\to 1.9}=\frac{5}{19}$

$\log_{5}^{14}=\underbrace{\log_{5}^{2}}_{0.5}+\underbrace{\log_{5}^{7}}_{1.4}$

$\log_{5}^{7}=\frac{\overset{\frac{28}{10}}{\log_{2}^{7}}}{\underset{\frac{10}{5}}{\log_{2}^{5}}}=1.4$

$\log_{14}^{5}=\frac{\log_{2}^{5}\ \frac{10}{5}}{\log_{2}^{14}\ 3.8}=\frac{10}{19}$

$\frac{5}{19}+\frac{10}{19}=\frac{15}{19}$ ✓

$\log_{2}^{14}=\underbrace{\log_{2}^{7}}_{2.8}+\underbrace{\log_{2}^{2}}_{1}$

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۶ (۲)

$\log_{3}^{5}=1.5 \qquad \log_{2}^{3}=1.6 \qquad \log_{15}^{6}=?$

$\log_{15}^{3}+\log_{15}^{2}=\log_{15}^{6}$

$\log_{15}^{2}=\frac{\log_{3}^{2}\ \frac{10}{16}}{\log_{3}^{15}\ \frac{25}{10}}=\frac{1}{4}$

$\log_{3}^{15}=\underbrace{\log_{3}^{5}}_{1.5}+\underbrace{\log_{3}^{3}}_{1}=2.5$

$\log_{15}^{3}=\frac{\log_{5}^{3}}{\log_{5}^{15}\ \frac{25}{15}}=\frac{10}{15}=\frac{2}{5}$

$\log_{5}^{15}=\log_{5}^{3}+\log_{5}^{5}$

$\frac{10}{15}+\frac{15}{15}=\frac{25}{15}$

$\frac{2}{5}+\frac{1}{4}=\frac{8+5}{20}=\frac{13}{20}$ ✓

(7) (2)

$\log_{8}^{18} = m \qquad \log_{4}^{12} = ?$

$\log_{8}^{18} = \log_{8}^{2} + \log_{8}^{9} = m$

$\log_{2^3}^{2} + \log_{2^3}^{3^2}$

$\frac{1}{3}\underbrace{\log_{2}^{2}}_{1} + \frac{2}{3}\log_{2}^{3} = \frac{1}{3} + \frac{2}{3}\log_{2}^{3} = m$

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

$\frac{2}{3}\log_{2}^{3} = (m - \frac{1}{3})$

$\log_{2}^{3} = \frac{(m-\frac{1}{3})\times 3}{2}$

$\log_{4}^{12} = \underbrace{\log_{4}^{3}}_{\frac{3m-1}{4}} + \underbrace{\log_{4}^{4}}_{1}$

$\frac{1}{2}\log_{2}^{3} = \frac{1}{2}\left(\frac{(m-\frac{1}{3})3}{2}\right)$

$\frac{1}{2}\log_{2}^{3} = \frac{3m-1}{4}$

$\frac{3m-1}{4} + \frac{4}{4} = \frac{3m+3}{4}$

$\log_{4}^{12} = \frac{3(m+1)}{4}$

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(8) (2)

$(0.4)^{2m-1} = \left(\frac{125}{8}\right)^{m^2} \qquad \log_{8}^{9m+1} = ?$

$\frac{2}{5}^{2m-1} = \frac{5}{2}^{3m^2} \longrightarrow 3m^2 = -2m+1$

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

$m^2 + 2m - 3 = 0$

$(m+3)(m-1)$

$\alpha(-6) = \frac{-3}{3} \qquad \frac{1}{3}$

$-1 \cancel{\times}$

$\log_{2^3}^{2^2} = \frac{2}{3}\log_{2}^{2} = \frac{2}{3}$

$\log_{2}^{3} = a \qquad \log_{8}^{b} = \frac{2}{3}(1+a)$ ۱,۵ ۹

$\log(3b-8) = ?$

$\log_{8}^{b} = \frac{1}{3}\log_{2}^{b} = \frac{2}{3}(1+a)$ $\quad \lg 100 = \boxed{2}$

$\log_{2}^{2} + \log_{2}^{3} = \log_{2}^{6} \qquad \frac{2}{3}\log_{2}^{6} = \log_{8}^{36}$

$\log_{8}^{b} \rightarrow b = 36$

$\log^{2} = \frac{-b}{2c} \longrightarrow \frac{b}{c} = \frac{1}{\log^{16}} \longrightarrow \frac{b}{c} = \log_{16}^{10}$ ۱۰

۰,۵

$\frac{b+c}{2} = a \rightarrow b+c = 2a \rightarrow b = c-2a \rightarrow \frac{b}{c} = -1 - \frac{2a}{c}$

$\frac{-2a}{c} = \log_{16}^{\frac{5}{8}} \longrightarrow \frac{a}{-c} = \log_{\frac{5}{8}}^{256} \rightarrow \frac{c}{a} \log_{256}^{\frac{5}{8}}$

$\frac{c}{a} = \frac{1}{8} \times (\log_{2}^{5} - 3) \rightarrow \left((2^{-\frac{1}{8}})^{\log_{2}^{5}-3}\right)$

$= \frac{5^{-\frac{1}{64}}}{8^{-\frac{1}{64}}} = \frac{8^{\frac{1}{64}}}{5^{\frac{1}{64}}} = \sqrt[64]{\frac{8}{5}}$

$a = \frac{b+c}{2} \rightarrow b = 2a - c$

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

معکوس $\rightarrow \frac{2a-c}{2a} = \lg_{2}^{10} \rightarrow 1 - \lg_{2}^{10} = \frac{c}{2a} \rightarrow 2 - \lg_{2}^{100} = \frac{c}{a}$

$(2^{-\frac{1}{8}})^{\frac{c}{a}} = (2^{\frac{c}{a}})^{-\frac{1}{8}} = (2^{2-\lg_{2}^{100}})^{-\frac{1}{8}} = (\frac{4}{100})^{-\frac{1}{8}} = 5^{\frac{1}{4}} = \boxed{\sqrt[4]{5}}$

Sibo

۲- $(0,1)$

الف) $\dfrac{x}{\log_{\frac{1}{2}} x} \geq 0 \rightarrow \dfrac{x}{-\log_{2} x} \geq 0 \xrightarrow{x>0} \log_{2} x < 0$

$x < 2^{0} \rightarrow \boxed{x < 1}$

ب) $x^2 - x - 2 > 0 \rightarrow (-\infty,-1) \cup (2,+\infty)$ (1)

$x^2 - 1 \geq 0 \rightarrow \begin{array}{l} x \geq 1 \\ x \leq -1 \end{array}$ (2)

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