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نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

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$n^a = m \qquad (mn)^b = m^2 n \rightarrow (n^a n)^b = n^{2a} n \rightarrow n^{b(a+1)} = n^{2a+1}$

$2a+1 = ba+b \rightarrow b = \frac{2a+1}{a+1} \rightarrow \frac{2(a+1)-1}{a+1} = 2 - \frac{1}{a+1} \rightarrow a>0$

$0 < \frac{1}{a+1} < 1 \rightarrow 1 < b < 2 \rightarrow [b] = 1 \qquad a+1>1$

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$2\log_9^a + \log_a^{\sqrt{9}} = 2 \rightarrow 2\log_{3^2}^{9} + \log_a^3 = 2 \rightarrow \frac{1}{\frac{2}{2}\log_9^3} + \log_a^3 = 2$

$\log_a^3 = t \rightarrow \frac{1}{t} + t \rightarrow \frac{1}{t} + t = 2 \quad t = 1$

$\log_a^3 = 1 \rightarrow a = 3$

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الف) $\frac{x}{\log_{\frac{1}{2}} x} > 0 \qquad \log_{\frac{1}{2}}^x \neq 0 \rightarrow \log_{\frac{1}{2}}^1 = 0 \rightarrow x \neq 1 \rightarrow 0 < x < 1$

$x > 0$

ب) $x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) > 0 \rightarrow -1, +2 \qquad x > 2, \; x < -1$

$x^2 - 1 \geq 0 \rightarrow x^2 \geq 1$

$x \geq 1, \; x \leq -1$

$0 < x < 1$

$\rightarrow (-\infty, -1) \cup (2, +\infty)$

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$\log 5 = \log \frac{10}{2} = \log 10 - \log 2 = 1 - \log 2 = 0/7$

$\log \frac{5}{3} = \log 5 - \log 3 = 0/7 - 0/4 = 0/3$

$\log 9 = \log 3^2 = 2\log 3 = 0/8$

$\log 15 = \log 3 \times 5 = \log 3 + \log 5 = 0/4 + 0/7 = 1/1 \rightarrow 0/3, 0/8, 1/1$

[illegible] $= \frac{14}{3}$

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$\log_2^7 \rightarrow \log_2^{\frac{14}{2}} \rightarrow \log_2^{14} - \log_2^2 = 2/8 \qquad \log_2^{14} = 3/8$

$\log_2^{10} \rightarrow \log_2^5 + \log_2^2 = 3 \qquad \log_2^5 = \frac{1}{\log_5^2}$

$\log_{14}^{10} = \frac{\log_2^{10}}{\log_2^{14}} = \frac{3}{3/8} = \frac{15}{19}$

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$\frac{1}{\log_5 3} = 1.5$ $\quad \frac{1}{\log_3 2} = 1.6$ $\quad \log_{15} 6 = \log_{15} 2 + \log_{15} 3 = \frac{40+25}{100} = \frac{65}{100}$ $\frac{\log_2 5}{\log_2 3} = 1.5$ $\quad \log_2 5 = 2.4$ $\quad \log_{15} 2 - \frac{1}{4}$ $\quad \log_3 5 + \log_3 3 = \log_3 15$ $\log_2 3 + \log_2 5 \to \log_2 15$ $\quad 1.5 + 1 = 2.5$ $\quad \log_{15} 3 \; \frac{10}{25}$ $\frac{\log 3}{\log 5} = 1.5$ $\quad 1.6 + 2.4 = 4 + \log_2 15$	۶
$\log_2 3^2 \times 2 \to \log_2 3 + \log_{2^3} 3^2 \to \frac{1}{3}\log_2 2 + \frac{2}{3}\log_2 3 \to \frac{1}{3} + \frac{2}{3}\log_2 3 = m$ $\frac{2}{3}\log_2 3 = m - \frac{1}{3}$ $\quad \log_2 3 = (m - \frac{1}{3}) \times \frac{3}{2}$ $\quad \log_2 3 = (m - \frac{1}{3})\frac{3}{2} \to \frac{3}{2}m - \frac{1}{2}$ $\to \frac{1}{2}(\frac{3}{2}m - \frac{1}{2}) + 1 \Rightarrow \frac{3}{4}m - \frac{1}{4} + \frac{4}{4} = \frac{3}{4}m + \frac{3}{4} \to \frac{3}{4}(m+1)$ $\log_4 3 = \frac{3}{4}(\log_2 18 + 1) = \log_4 12 \to \frac{3}{4}(m+1)$	۷
$(\frac{2}{5})^{2x-1} \to (\frac{5}{2})^{1-2x} = (\frac{125}{8})^{x^2} \to (\frac{5}{2})^{1-2x} = (\frac{5}{2})^{3x^2} \to 1 - 2x = 3x^2$ $3x^2 + 2x - 1 = 0 \to x^2 + 2x - 3 = 0 \to (x-1)(x+3) = 0 \to -1$ غ ق ق $\to \frac{1}{3}$ $\log_8 4 \to \log_{2^3} 2^2 \to \frac{2}{3}\log_2 2 = \frac{2}{3}$	۸
$2^a = 3$ $\quad 8^{\frac{2}{3} + \frac{2}{3}a} = b \Rightarrow 2^{2a+2} = b \to 2^2 \times (2^a)^2 = b$ $b = 4 \times 9 = 36$ $\quad \log(3(36-8)) = \log(100) = 2$	۹
$a = \frac{b+c}{2} \to b = 2a - c \to \frac{1}{\log_{25} 4} = \frac{1}{5} = \frac{25}{b} = \frac{25}{2a-c} = 2\log_5 2$ $\to \frac{2a}{2a-c} = \log 2 \xrightarrow{\text{معکوس}} \frac{2a-c}{2a} = \log_2 10 \to 1 - \log_2 10 = \frac{c}{2a}$ $\to 2 - \log_2 10 = \frac{c}{a}$ $\quad (\frac{1}{\sqrt{2}})^{\frac{c}{a}} = (2^{\frac{c}{a}})^{-\frac{1}{2}} \longrightarrow (2^{2-\log_2 10})^{-\frac{1}{2}}$	۱۰

$(\frac{2^2}{2^{\log_2 10}})^{-\frac{1}{2}} = (\frac{4}{100})^{-\frac{1}{2}} = \frac{4}{25}$