نام و نام خانوادگی: غزل عباس‌فر   کلاس یازدهم دوره A   تکلیف شماره ۲۳

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

$[b] = 1$

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الف) $\frac{x}{\log_{\frac{1}{2}} x} \geq 0 \quad x > 0 \quad x \neq 1 \; (\log_{\frac{1}{2}} x \neq 0)$

$\log_{\frac{1}{2}} x \quad$ if $x > 0 \to \log_{\frac{1}{2}} x > 0$ کسر باید $\geq 0 \quad \log_{\frac{1}{2}} x > 0 \quad \boxed{x < 1}$

ب) $x^2 - x - 2 > 0 \longrightarrow x < -1 \;,\; x > 2$ ① $\sqrt{x^2 - 1} \neq -1$ همواره برقرار

$x^2 - 1 \geq 0 \quad x \geq 1 \,,\, x \leq -1$ ② ① ∩ ② $(-\infty, -1) \cup (2, +\infty)$

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$2\log_9 a + \log_a \sqrt{9} = 2 \Longrightarrow \log_3 a + \frac{1}{\log_3 a} = 2 \quad x + \frac{1}{x} = 2 \quad x = 1$

$\log_3 a = 1 \quad a = 3$

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$[\log \frac{5}{3}] x^2 + (\log 9) x - \log 15 = 0 \quad \log 9 = \log 3 + \log 3 = 0.8 \quad \log \frac{5}{3} = \log \frac{\frac{10}{2}}{3} =$

$\log \frac{10}{2} - \log 3 = \log 10 - \log 2 - \log 3 = 0.7 - 0.4 = 0.3 \quad \log 15 = \log \frac{10}{2} + \log 3 =$

$0.7 + 0.4 = 1.1 \Longrightarrow 0.3x^2 + 0.8x - 1.1 = 0 \xrightarrow{\times 10} x = 1 \quad x = -\frac{11}{3}$

$|1 - (-\frac{11}{3})| = \frac{14}{3}$

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$\log_{14} 10 = \frac{\log_2 10}{\log_2 14} = \frac{\log_2 2 + \log_2 5}{\log_2 7 + \log_2 2} = \frac{1+2}{1+2.8} = \frac{3}{3.8} = \frac{15}{19}$

$\log_5 2 = 0.5 \longrightarrow \log_2 5 = 2$

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$\log_{15} 6 = \frac{\log_3 6}{\log_3 15} = \frac{\log_3 2 + \log_3 3}{\log_3 5 + \log_3 3} = \frac{\frac{5}{8} + 1}{1.5 + 1} = \frac{\frac{13}{8}}{\frac{25}{10}} = 0.65$

$\log_2 3 = 1.6 \longrightarrow \log_3 2 = \frac{10}{16}$

$\log_{2}^{18} \times \frac{1}{3} = m \overset{①}{\Longrightarrow} \log_{2}^{12} \times \frac{1}{2} = (\log_{2}^{4} + \log_{2}^{3}) \times \frac{1}{2} =$ 7

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

① $\cancel{\log_{2}^{9}} + \log_{2}^{2} = 3m \longrightarrow \log_{2}^{3} = \frac{3m-1}{2}$

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

$(0.4)^{2x-1} = \left(\frac{5}{2}\right)^{3x^2} \Longrightarrow (0.4)^{-3x^2} \quad -3x^2 = 2x-1$ 8

$3x^2 + 2x - 1 = 0 \quad x = -1 \quad x = \frac{1}{3} \Longrightarrow \log_{8}^{4} = \frac{2}{3} = \frac{2}{3}\log_{2}^{2}$

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$\log_{8}^{b} = \frac{1}{3}\log_{2}^{b} = \frac{2}{3}(1+a) \quad b = 2^{2+2a} \quad \log_{2}^{3} = a \quad 2^{a} = 3$ 9

$b = 2^{2} \times 2^{2a} = 4 \times (2^{a})^{2} = 36$

$\log 4 = \frac{4a}{b} \quad \frac{a}{b} = \frac{\log 4}{4} \quad \frac{b}{a} = \frac{4}{\log 4} \quad a + b = c \xrightarrow{\div a} \frac{c}{a} = 2 - \frac{b}{a}$ 10

$2 - \frac{4}{\log 4} = \frac{c}{a} \Longrightarrow 2 - \frac{2}{\log 2} = 2\left(1 - \frac{1}{\log 2}\right) = 2 - 2\log_{2}^{10}$

$2 - 2\left(\log_{2}^{5} + \cancel{\log_{2}^{2}}^{\,1}\right) = 2 - 2\log_{2}^{5} - 2 = -2\log_{2}^{5}$

$\left[\frac{1}{\sqrt[8]{2}}\right]^{\frac{c}{a}} = 2^{\frac{-1}{8} \times -2\log_{2}^{5}} = 2^{\frac{1}{4}\log_{2}^{5}} = 2^{\log_{2}^{\sqrt[4]{5}}}$

$= \sqrt[4]{5}^{\log_{2}^{2}} = \sqrt[4]{5}$