Subject: ....

Date: ....

کلاس معنی

$$\log_n m = a \qquad \cancel{\log_{mn} mn} + \log_{mn} m = \log_{mn} m^2 n = b \Rightarrow b = 1 + \frac{a}{1+a} \quad \text{-۱}$$

$$1 \qquad \frac{\log_n m}{\log_n m + 1}$$

$$\downarrow$$

$$[b] = 1$$

$$\frac{x}{\log_{\frac{1}{2}} x} \geq 0 \longrightarrow \begin{array}{ccccc} & 0 & & 1 & \\ - & & + & & - \end{array} \quad \text{-۲}$$

$$x > 0$$

$$\Big\} \longrightarrow D_f = (0, 1)$$

$$x^2 - 1 \geq 0 \qquad \begin{array}{ccccc} & -1 & & 1 & \\ + & & - & & + \end{array}$$

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

$$x^2 - x - 2 > 0 \qquad \begin{array}{ccccc} & -1 & & 2 & \\ + & & - & & + \end{array}$$

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

$$2\underbrace{\log_x a}_{t} + \frac{1}{2}\log_a x = 2 \longrightarrow 2t + \frac{1}{2t} = 2 \to 4t^2 - 4t + 1 = 0 \quad \text{-۳}$$

$$t = \frac{1}{2} \to \log_x a = \frac{1}{2} \longrightarrow \sqrt{x} = a \longrightarrow a = 3$$

$$(\underbrace{\log 5}_{0/7} - \underbrace{\log 4}_{0/6})x^2 + (\underbrace{2\log 3}_{0/96})x - (\underbrace{\log 5}_{0/7} + \underbrace{\log 3}_{0/48}) \Rightarrow 0/1x^2 + 0/96x - 1/18 = 0 \quad \text{-۴}$$

$$\log 5 = 1 - \underbrace{\log 2}_{0/3}$$

$$\downarrow$$

اختلاف ریشه‌ها $= \dfrac{\sqrt{96^2 \times 10^{-4} + 4 \times 3 \times 11 \times 10^{-2}}}{3 \times 10^{-1}}$

$$= \boxed{\frac{14}{3}}$$

$$\frac{\log_2 5 + 1}{\log_2 7 + 1} = \frac{3}{3/8} = \boxed{\frac{15}{19}} \quad \text{-۵}$$

$\frac{1}{1.6}$

$\log_{15} 6 = \dfrac{\log_3 2 + 1}{\dfrac{\log_3 5 + 1}{1.5}} = \dfrac{\frac{13}{\cancel{8}}}{2.5} = \dfrac{13}{20}$ —6

$\underbrace{\frac{2}{3}\log_2 3}_{\log_8 9} + \underbrace{\frac{1}{3}}_{\log_8 2} = m$ $\qquad \log_4 12 = 1 + \frac{1}{2}\log_2 3 = 1 + \frac{1}{2} \times \frac{3}{2}\left(m - \frac{1}{3}\right)$ —7

$\log_2 3 = \left(m - \frac{1}{3}\right)\frac{3}{2}$ $\qquad = 1 + \frac{3}{4}m - \frac{1}{4} = \boxed{\frac{3}{4}(m+1)}$

$\left(\frac{2}{5}\right)^{2x-1} = \left(\frac{5}{2}\right)^{3x^2} \longrightarrow \left(\frac{5}{2}\right)^{1-2x} = \left(\frac{5}{2}\right)^{3x^2} \longrightarrow 3x^2 + 2x - 1 = 0 \begin{cases} x = -1 & \text{غ ق ق} \\ x = \frac{1}{3} \end{cases}$ —8

$\log_8 \overset{4}{\cancel{\frac{1}{3}\times 9 + 1}} = \boxed{\frac{2}{3}}$

$\frac{1}{3}\log_2 b = \frac{2}{3}(\underbrace{\cancel{2}}_{\log_2 4} + \log_2 3) \longrightarrow \log_2 b = 2\log_2 6 \longrightarrow \boxed{b = 36}$ —9

$\log (36 \times 3 - 8) = \log 100 = \boxed{2}$

$\frac{1}{\alpha + \beta} = \log 4 \longrightarrow \frac{\cancel{2}b}{\cancel{2}4a} = \log_4 10 \longrightarrow b = 4a\log_4 10$ —10

$b + c = 2a \longrightarrow c = 2a - b \Longrightarrow \frac{c}{a} = 2 - 4\log_4 10 = 2 - 2\log_2 10$

$\left(2^{-\frac{1}{8}}\right)^{2 - 2(\log_2 5 + 1)} = 2^{\frac{1}{4}\log_2 5} = 5^{\frac{1}{4}\log_2 2} = \boxed{\sqrt[4]{5}}$