

$f(1) = g(1) \Rightarrow r^{A+B} = 1 = r^0 \Rightarrow A+B=0$
 $f(r) = g(r) \Rightarrow r^{rA+B} = r = r^1 \Rightarrow rA+B=1$

(A و B نى قىممىنى تاپىڭ) $\Rightarrow A=1, B=1$ (1)

$f(x) = g(x) = r^{x-1} \Rightarrow f(0) = r^{-1} = \frac{1}{r}$

$\log_r(r^x + 1) = x + r \Rightarrow r^x + 1 = r^{x+r} \Rightarrow (r^x)^x + 1 = r^x \times r^r$
 $\Rightarrow (r^x)^2 + 1 = r \times r^x$ $\xrightarrow{t=r^x}$ $t^2 + 1 = r t \Rightarrow t^2 - r t + 1 = 0$
 $\Rightarrow (t-r)(t-1) = 0 \Rightarrow \begin{cases} t=r \Rightarrow r^x = r \Rightarrow \log_r r^x = \log_r r \Rightarrow x = \log_r r \\ t=1 \Rightarrow r^x = 1 \Rightarrow \log_r r^x = \log_r 1 \Rightarrow x = \log_r 1 \end{cases}$
 \Rightarrow كۆپچىلىك جاۋاب $= \log_r r + \log_r 1 = \log_r \frac{r \cdot 1}{r}$ (2)

$1 \times 2 \times 3 = r_1^r \times r^r \quad 1 \times v = r_1^r \times v \Rightarrow A = (\log_{r_1} r)^r + \log_{r_1} (r_1 \times v) \times \log_{r_1} (r_1^r \times r)$
 $\Rightarrow A = (\log_{r_1} r)^r + (\log_{r_1} r_1 + \log_{r_1} v) (\log_{r_1} r_1^r + \log_{r_1} r)$
 $\Rightarrow A = (\log_{r_1} r)^r + (1 + \log_{r_1} v) \times (r \log_{r_1} r_1 + \log_{r_1} r) \Rightarrow \log_{r_1} r + \log_{r_1} v = \log_{r_1} r \Rightarrow \log_{r_1} v = 1 - \log_{r_1} r$
 $A = (\log_{r_1} r)^r + (1 + 1 - \log_{r_1} r) \times (r + \log_{r_1} r) = (\log_{r_1} r)^r + (2 - \log_{r_1} r) \times r \Rightarrow A = (\log_{r_1} r)^r + r(2 - \log_{r_1} r)$ (3)

$\log_r(r^{2r-2r+1}) + r \log_r(1-r) = a \Rightarrow \log_r(r-1)^r + \log_r(1-r)^r = a$
 $\log_r(1-r)^r + \log_r(1-r)^r = a \Rightarrow \log_r (1-r)^r \times (1-r)^r = a \Rightarrow \log_r (1-r)^{2r} = a \Rightarrow (1-r)^{2r} = 10^a$
 $\Rightarrow 1-r = 10^{\frac{a}{2r}} \Rightarrow r = -A \quad \log_r(-r) \Rightarrow \log_r(-(-9)) = \log_r 9 = 2$ (4)

$\log_r(r^{2r+2r+1}) + \log_r(r-r) = r \quad \log_r \frac{r}{r-r} = ?$
 $\Rightarrow \log_r(r^{2r+2r+1})(r-r) = r \Rightarrow \log_r(r^{4r+1})(r-r) = r \Rightarrow \log_r(r^{4r+1}) + \log_r(r-r) = r$
 $\Rightarrow \log_r \frac{r^{4r+1}}{r-r} = r \Rightarrow \log_r \frac{r^{4r+1}}{r(1-r)} = r \Rightarrow \log_r(r^{4r+1}) - \log_r(r(1-r)) = r$
 $\Rightarrow \log_r(r^{4r+1}) - \log_r r - \log_r(1-r) = r \Rightarrow \log_r(r^{4r}) - \log_r(1-r) = r$
 $\Rightarrow \log_r(r^{4r}) = r + \log_r(1-r) \Rightarrow r^4 = r + \log_r(1-r)$
 $\Rightarrow \log_r \frac{r^4}{r} = \log_r \frac{r^3}{r} = \log_r r^2 = 2$ (5)

$\log(r-u) - \log \frac{1}{(u-r)^r} = r \Rightarrow \log(r-u) - \log \frac{1}{(r-u)^r} = r \Rightarrow \log \frac{(r-u)}{(r-u)^r} = r$
 $\Rightarrow \log(r-u)^{1-r} = r \Rightarrow 10^r = (r-u)^{1-r} \xrightarrow{\sqrt{\quad}} 10 = r-u \Rightarrow u = -1$
 $\log \frac{(-u)}{\sqrt{r}} \Rightarrow \log \frac{1}{\sqrt{r}} = \log \frac{r^r}{r} = r \log \frac{r}{r} = 0$ (6)

$\log \frac{(u-r)}{r} = ? \quad r^{u^r-r} = 11 \Rightarrow r^{u^r-r} = r^{4u} \Rightarrow u^r - r = 4u \Rightarrow u^r - 4u - r = 0$
 $\Rightarrow \Delta = \sqrt{b^2 - 4ac} = \sqrt{16 + 4r} = \sqrt{4(4+r)} = 2\sqrt{4+r}$
 $\Rightarrow u = \frac{r \pm 2\sqrt{4+r}}{r} \rightarrow \text{قۇبۇل قىلىڭ}$
 $\Rightarrow \log \frac{(r + \sqrt{4+r} - r)}{r} = \log \frac{\sqrt{4+r}}{r} = \log \frac{r^r}{r} = \frac{1}{r} \log r^r = \frac{1}{r}$ (7)

①

$$\log_r \mu = \frac{a}{\lambda} \quad \log_{1/\lambda} \mu = ?$$

$$\Rightarrow \frac{\log_r \mu}{\log_{1/\lambda} \mu} = \frac{\log_r \mu}{\log_r \mu + \log_r \mu} = \frac{\log_r \mu}{\log_r \mu + 1} = \frac{\frac{a}{\lambda}}{\frac{a}{\lambda} + 1} = \frac{a}{a + \lambda}$$

②

$$\log_r \mu = 0.1\lambda$$

$$\log_{1/\lambda} \mu = ? \Rightarrow \frac{\log_r \mu}{\log_r \lambda} = \frac{\log_r \mu + \log_r \mu}{\log_r \mu + \log_r \lambda} = \frac{0.1\lambda + \frac{1}{\lambda}}{0.1\lambda + 1} = \frac{\frac{1\lambda}{10} + \frac{1}{\lambda}}{\frac{1\lambda}{10} + 1} = \frac{1\lambda}{1\lambda}$$

③

$$(a \log_r) x^r + a x + b \log_r x = 0$$

$$x = -1 \xrightarrow{ax^r + bx = 0} a + c = b \Rightarrow a \log_r x + b \log_r x = a \Rightarrow b \log_r x = a - a \log_r x$$

$$(\sqrt{x})^{\frac{b}{a}} = ? \Rightarrow b \log_r x = a (1 - \log_r x) \Rightarrow \frac{b}{a} = \frac{1 - \log_r x}{\log_r x}$$

$$\Rightarrow \frac{\log_{10} 10 - \log_r x}{\log_r x} = \frac{\log \frac{10}{x}}{\log_r x} = \frac{\log 10}{\log_r x} = \log_r 10$$

$$\Rightarrow (\sqrt{x})^{\frac{b}{a}} = (\sqrt{x})^{\log_r 10} \rightarrow = (10)^{\log_r \sqrt{x}} = 10^{\frac{1}{r} \log_r x} = 10^{\frac{1}{r}} = \sqrt[r]{10}$$