

$$\log_{10}^9 = \frac{\log_{10}^9}{\log_{10}^{10}} = \frac{1 + \log_{10}^9}{1 + \log_{10}^{10}} = \frac{1 + \frac{1}{10}}{1 + 1} = \frac{\frac{11}{10}}{2} = \frac{11}{20} = \frac{11}{20} \cdot \frac{10}{10} = \frac{11}{20} \cdot \frac{1}{1} = \frac{11}{20} \quad \checkmark$$

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$$\frac{\log r + r \log r}{r \log r} = m$$

$$\log r + r \log r = r m \log r$$

$$(r m - 1) \log r = r \log r \Rightarrow \frac{\log r}{\log r} = \frac{r m - 1}{r}$$

$$1 + \log_r^r = 1 + \frac{1}{r} \log_r^r$$

$$1 + \frac{r m - 1}{r} = \frac{r m}{r} = \frac{r}{r} (m) \quad \checkmark$$

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$$\left(\frac{a}{r}\right)^{r a^r} = \left(\frac{a}{r}\right)^{1 - r a}$$

$$r a^r + r a - 1 = 0$$

$$a^r + r a - r = 0$$

$$(a + r) a - 1 = 0$$

$$a = -1 \quad \frac{0}{0}$$

$$a = \frac{1}{r} \quad \frac{0}{0}$$

$$\log_{10}^{9 a + 1} \Rightarrow \log_{10}^r = \frac{r}{r} \quad \checkmark$$

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$$\log_{10}^b = \frac{r}{r} (1 + \log_r^r) \Rightarrow \frac{1}{r} \log_r^b = \frac{r}{r} \log_r^r \Rightarrow \log_r^b = \log_r^r$$

$$\log_{10}^{r(r a - 1)} = \log_{10}^{100} = r \quad \checkmark$$

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$$\frac{1}{-b} = \log_{10}^f \Rightarrow \frac{1 a}{b} = \log_{10}^f \Rightarrow \frac{f a}{b} = \log_r^r \Rightarrow r a = \frac{\log_r^r}{r}$$

$$a = \frac{\log_r^r}{r} b$$

$$\Rightarrow r a = b + c \Rightarrow b \left(\frac{\log_r^r}{r} - 1 \right) = c$$

$$\left(r^{-\frac{1}{r}} \right)^{\frac{c}{a}} = \left(r^{-\frac{1}{r}} \right)^{\frac{b \left(\frac{\log_r^r}{r} - 1 \right)}{b \left(\frac{\log_r^r}{r} \right)}} = \left(r^{-\frac{1}{r}} \right)^{\frac{r \log_r^r - r}{\log_r^r}} = r^{-\frac{1}{r} \left(\frac{\log_r^r - r}{\log_r^r} \right)}$$

$$r^{-\frac{1}{r} \log_r^r} = r^{\log_r^r} = \frac{r}{100} = \frac{r}{100} \quad \checkmark$$

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(1, 2)

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

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$$\frac{1}{n_1 + n_2} = \frac{1}{S} = \frac{ra}{b} = \frac{ra}{ra-c} = \lg r = \cancel{r} \lg r \rightarrow \frac{ra}{ra-c} = \lg r$$

$$\underline{\text{معلوم}}, \quad \frac{ra-c}{ra} = \lg_r^{10} \rightarrow 1 - \lg_r^{10} = \frac{c}{ra} \rightarrow r - \lg_r^{10} = \frac{c}{a}$$

$$\left(r^{-\frac{1}{n}}\right)^{\frac{c}{a}} = \left(r^{\frac{c}{a}}\right)^{-\frac{1}{n}} = \left(r^{r - \lg_r^{10}}\right)^{-\frac{1}{n}} = \left(\frac{r}{10}\right)^{-\frac{1}{n}} = 2^{\frac{1}{f}} = \boxed{\sqrt[n]{2}}$$