

$$1. \log_n^m a$$

$$1. \log_{mn}^m b \rightarrow b = \frac{1. \log_n^m a}{1. \log_n^m a} = \frac{1. \log_n^m a + 1. \log_n^m a}{1. \log_n^m a + 1. \log_n^m a} = \frac{2 \log_n^m a}{2} = \log_n^m a$$

$$\Rightarrow \frac{2a-1}{a+1} \Rightarrow b = \frac{2(a+1)-1}{a+1} = 2 - \frac{1}{a+1} \Rightarrow 2-2 < b < 2 \Rightarrow [b] = 1$$

الف) $\sqrt{\frac{a}{\log \frac{1}{a}}} \rightarrow \geq 0, \log \frac{a}{1} > 0 \Rightarrow a \geq 0$

ب) $\log_r^{(a^2-2r-2)} = 0 \rightarrow a^2 - 2r - 2 = 0 \rightarrow a^2 = 2r + 2 \rightarrow a = \sqrt{2r+2}$

$\sqrt{a^2-1} + 1 \rightarrow a^2 - 1 \geq 0 \rightarrow a^2 \geq 1 \rightarrow a \geq 1, a \leq -1 \Rightarrow D = (-\infty, -1) \cup (1, \infty)$

$$2. \log_a^a + \log_a^{\sqrt{a}} = 2 \rightarrow 2 \log_a^a + \log_a^{\sqrt{a}} = 2 \rightarrow \log_a^a + \log_a^{\sqrt{a}} = 1$$

$$\rightarrow t + \frac{1}{t} = 2 \rightarrow \frac{t^2 + 1}{t} = 2 \Rightarrow t^2 - 2t + 1 = 0 \rightarrow t = 1$$

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

$$\log_r = 0/3, \log_r = 0/4 \rightarrow \log_a = 1. \log 1 - 1. \log 2 = 1 - 0/3 = 0/3$$

$$[1. \log \frac{5}{3}] a^2 + (1. \log 9) a - 1. \log 15 = 0$$

$$\log_a - \log_r = 0/16 - 0/4 = 0/12 \rightarrow -1. \log 15 = -(1. \log 3 + 1. \log 5) = -1.1$$

$$2a^2 + 8a - 11 = 0 \xrightarrow{a+b+c=0} a_1 = 1, a_2 = \frac{c}{a} = -\frac{11}{2} \Rightarrow 1 - (-\frac{11}{2}) = \frac{15}{2}$$

$$\log_r^v = 2/16, \log_a^r = 0/15 \rightarrow \frac{1}{1. \log \frac{5}{3}} = \frac{1}{0/15} = 2 = \log_r^5$$

$$1. \log_{14}^1 = ? \rightarrow \frac{1. \log \frac{1}{2}}{1. \log \frac{1}{4}} = \frac{1. \log (2 \times 5)}{1. \log (2 \times 7)} = \frac{1. \log 2 + 1. \log 5}{1. \log 2 + 1. \log 7} = \frac{1+2}{1+2.1} = \frac{3}{3}$$

الف) $\frac{a}{\log \frac{1}{a}} \geq 0 \rightarrow \log_r^a < 0 \rightarrow a < 2-1 \rightarrow \begin{cases} a > 0 \\ a < 1 \end{cases} \rightarrow 0 < a < 1$

$$\log_{\frac{1}{r}} \omega = 1, \omega, \log_{\frac{1}{r}} \frac{1}{r} = 1, r \rightarrow \frac{1}{\log_{\frac{1}{r}} \frac{1}{r}} = \frac{1}{1, r} = \frac{1}{1, r} = 0,14502 \log_{\frac{1}{r}} \frac{1}{r}$$

$$\log_{\frac{1}{10}} \frac{1}{r} = ? \rightarrow \log_{\frac{1}{r}} \frac{1}{10} = \frac{\log_{\frac{1}{r}} \frac{1}{r} + 1}{\log_{\frac{1}{r}} \omega + 1} = \frac{0,1450 + 1}{1, \omega + 1} = \frac{1,1450}{1, \omega}$$

0,145 ✓

$$\log_{\frac{1}{r}} \frac{1}{r} \cdot m \rightarrow \log_{\frac{1}{r}} \frac{1}{r} \Rightarrow m \cdot \frac{1}{r} \log_{\frac{1}{r}} \frac{1}{r} \Rightarrow \log_{\frac{1}{r}} \frac{1}{r} \cdot m$$

$$\log_{\frac{1}{r}} \frac{1}{r} + \log_{\frac{1}{r}} \frac{1}{r} = r \cdot m \Rightarrow 1 + r \log_{\frac{1}{r}} \frac{1}{r} = r \cdot m \rightarrow \log_{\frac{1}{r}} \frac{1}{r} = \frac{r \cdot m - 1}{r}$$

$$\log_{\frac{1}{r}} \frac{1}{r} \rightarrow \frac{\log_{\frac{1}{r}} \frac{1}{r}}{\log_{\frac{1}{r}} \frac{1}{r}} = \frac{\log_{\frac{1}{r}} \frac{1}{r}}{\log_{\frac{1}{r}} \frac{1}{r}} = \frac{\log_{\frac{1}{r}} \frac{1}{r} + \log_{\frac{1}{r}} \frac{1}{r}}{r} = \frac{r + \log_{\frac{1}{r}} \frac{1}{r}}{r} = \frac{r + (r \cdot m - 1)}{r}$$

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

$$(0,1)^{r \cdot m - 1} = \left(\frac{1}{10}\right)^{r \cdot m - 1} \Rightarrow \left(\frac{r}{\omega}\right)^{r \cdot m - 1} = \left(\frac{r}{\omega}\right)^{r \cdot m - 1} \Rightarrow \left(\frac{\omega}{r}\right)^{r \cdot m - 1} = \left(\frac{\omega}{r}\right)^{r \cdot m - 1}$$

$$\Rightarrow \left(\frac{\omega}{r}\right)^{-r \cdot m + 1} = \frac{\omega}{r} \Rightarrow \omega \cdot r^{r \cdot m - 1} = r \Rightarrow \omega \cdot r^{r \cdot m - 1} = r \Rightarrow \omega \cdot r^{r \cdot m - 1} = r$$

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$$\Rightarrow \log_{\frac{1}{r}} \frac{1}{r} \rightarrow \log_{\frac{1}{r}} \frac{1}{r} = \frac{r}{r} \log_{\frac{1}{r}} \frac{1}{r} = \frac{r}{r} \quad \checkmark$$

$$\log_{\frac{1}{r}} b = \frac{r}{r} (1 + a), \log_{\frac{1}{r}} \frac{1}{r} = a$$

$$\log_{\frac{1}{r}} (r \cdot b - 1) \rightarrow \frac{1}{r} \log_{\frac{1}{r}} \frac{1}{r} = \frac{r}{r} (1 + a) \rightarrow \log_{\frac{1}{r}} \frac{1}{r} = r (1 + a)$$

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$$\Rightarrow \log_{\frac{1}{r}} b = \log_{\frac{1}{r}} \frac{1}{r} = \log_{\frac{1}{r}} \frac{1}{r} = \log_{\frac{1}{r}} \frac{1}{r} \quad \checkmark$$

$$-f \cdot a \cdot r + b \cdot a + \frac{1}{r} \cdot c = 0 \rightarrow b + c \cdot r \rightarrow r \cdot a = b + c \Rightarrow r = \frac{b + c}{a}$$

$$\left[\frac{1}{r}\right]^{\frac{c}{a}} \Rightarrow r \cdot \frac{1}{r} \cdot r \log_{\frac{1}{r}} \frac{1}{r} = r \log_{\frac{1}{r}} \frac{1}{r} = \frac{r}{r} \quad \checkmark$$

$$\Rightarrow r = \frac{b}{-f \cdot a} = \frac{b}{f \cdot a} \rightarrow \log_{\frac{1}{r}} \frac{1}{r} = \frac{1}{\frac{b}{f \cdot a}} = \log_{\frac{1}{r}} \frac{1}{r} = \frac{f \cdot a}{b} \Rightarrow r \log_{\frac{1}{r}} \frac{1}{r} = \frac{f \cdot a}{b}$$

$$\Rightarrow \frac{1}{r} \times \frac{1}{\log_{\frac{1}{r}} \frac{1}{r}} = \frac{a}{b} \Rightarrow \frac{b}{a} = r \log_{\frac{1}{r}} \frac{1}{r}, \frac{c}{a} = r - r \log_{\frac{1}{r}} \frac{1}{r}$$

$$\Rightarrow r = r (\log_{\frac{1}{r}} \frac{1}{r} + r \log_{\frac{1}{r}} \frac{1}{r}) \Rightarrow \frac{c}{a} = r - r \log_{\frac{1}{r}} \frac{1}{r}$$