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$$\log_n^m = a \Rightarrow m = n^a$$

$$\log_{mn}^{m^r n} = b$$

$$\log_n^{n^{ra+1}} = b \Rightarrow \frac{ra+1}{a+1} \log_n n = b = \frac{ra+1}{a+1} \quad (2) - 1$$

$$\frac{a+1}{a+1} < \frac{ra+1}{a+1} < \frac{ra+r}{a+1} \Rightarrow 1 < \frac{ra+1}{a+1} < r$$

$$\frac{ra+1}{a+1} = b \Rightarrow [b] = 1 \quad \checkmark$$

$$y = \sqrt{\frac{x}{\log_{1/r} x}} \rightarrow \log_{1/r} x \neq 0 \Rightarrow x \neq 1$$

	-	0	+	1	
x	-	0	+	+	
$\log_{1/r} x$	X	0	+	0	-
$\frac{x}{\log_{1/r} x}$	X	0	+	0	-

$$(0, 1] = Df \quad \text{دقت!}$$

$$y = \frac{\log_{1/r} x - x - r}{\sqrt{x^2 - 1} + 1} \rightarrow$$

$$x^2 - x - r > 0 \Rightarrow (x-r)(x+1) > 0 \Rightarrow x > r \text{ or } x < -1$$

$$x^2 - 1 > 0 \Rightarrow x^2 > 1 \Rightarrow x > 1 \text{ or } x < -1$$

$$\sqrt{x^2 - 1} + 1 \neq 0 \quad \checkmark$$

$$Df = (-\infty, -1) \cup (r, +\infty) \quad \checkmark$$

$$r \log_x a + \log_a \sqrt{x} = r \xrightarrow{x=a} r \log_a a + \log_a a = r \times \frac{1}{r} \log_a a + \log_a a = r \quad (2) - 2$$

$$t + \frac{1}{t} = r \rightarrow t^2 - rt + 1 = 0 \Rightarrow (t-1)^2 = 0 \Rightarrow t=1 \Rightarrow a=r^t \quad \checkmark$$

$$(\log_r^a) x^r + (\log_a^r) x - \log^{10} = 0 \quad \log \frac{a}{r} + \log^r - \log^{10} = \log \frac{a}{r} + \frac{r}{10} = 0 \quad (2) - 3$$

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$$x_1 = 1$$

$$x_r = \frac{c}{a} = \frac{-\log^{10}}{\log \frac{a}{r}} = - \frac{\log^{10} + \log^r}{\log^{10} - \log^r}$$

$$|x_1 - x_r| = |1 + \frac{11}{r}| = |1 + \frac{11}{r}| = \frac{12}{r} \quad \checkmark$$

$$\frac{\frac{1}{r} + \frac{1}{r}}{\frac{1}{r} - \frac{1}{r}} = - \frac{\frac{2}{r}}{\frac{0}{r}} = - \frac{11}{r}$$

$$\log_r^v = r/r$$

$$\log_{10}^r = 1/0 \Rightarrow \log_r^{10} = r \rightarrow \log_r^{10} = \frac{1}{\log_{10}^r} = r$$

$$\log_{10}^r = \frac{\log_r^r}{\log_r^{10}} = \frac{1 + \log_r^r}{1 + \log_r^{10}} = \frac{1 + \frac{1}{r}}{1 + \frac{1}{r}} = \frac{1}{r} \quad \checkmark$$

$$\log_r^b = 1/0$$

$$\log_r^r = 1/4 \Rightarrow \log_r^r = \frac{1}{\log_r^r} = \frac{1}{1/4} = \frac{a}{\lambda}$$

$$\log_{10}^r = \frac{\log_r^4}{\log_r^{10}} = \frac{1 + \log_r^r}{1 + \log_r^a} = \frac{1 + \frac{a}{\lambda}}{1 + \frac{r}{r}} = \frac{1r}{r} \checkmark$$

$$\log_{\lambda}^{1n} = m$$

$$\log_{\lambda}^{1n} = \frac{\log_r^{1n}}{\log_r^{\lambda}} = \frac{1 + r \log_r^r}{r}$$

$$\frac{r \log_r^r + 1}{r} = m \Rightarrow \log_r^r = \frac{r m - 1}{r} \quad (r) \quad -v$$

$$\log_r^{1r} = \frac{\log_r^{1r}}{\log_r^{\lambda}} = \frac{r + \log_r^r}{r} \rightarrow \frac{r + \frac{r m - 1}{r}}{r} \times \frac{r}{r} = \frac{r + r m - 1}{r} = \frac{r m + r}{r} \checkmark$$

$$(\frac{1}{r})^{rx-1} = (\frac{1}{\lambda})^{rx} \Rightarrow (\frac{r}{1})^{rx-1} = (\frac{a}{r})^{rx} \Rightarrow (\frac{r}{a})^{rx-1} = (\frac{a}{r})^{rx} \quad -A$$

$$-rx + 1 = rx \Rightarrow rx^r + rx - 1 = 0 \quad \begin{cases} x = -1 \\ x = -\frac{1}{a} = \frac{1}{r} \checkmark \end{cases}$$

$$\log_{\lambda}^{(rx+1)} = \log_{\lambda}^{\lambda} = \log_r^{r^r} = \frac{r}{r} \log_r^r = \frac{r}{r} \checkmark$$

$$\log_r^r = a$$

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

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

$$\frac{r}{r} \log_r^r = \log_{\lambda}^{r^r} \Rightarrow \log_{\lambda}^b = \log_{\lambda}^{r^r} \Rightarrow b = r^r \checkmark$$

$$\log^{(rb-a)} = \log^{(1...)} = r \checkmark$$

$$\frac{1}{a+b} = \frac{1}{5} = \log^{\lambda} \rightarrow S = \log_{\lambda}^1$$

$$S = \frac{b}{fa}$$

$$\frac{b}{fa} = \log_{\lambda}^1 \Rightarrow \frac{fa}{b} = \log^r \Rightarrow \frac{a}{b} = \frac{1}{\lambda} \log^{\lambda} \quad (r) \quad -a$$

$$b+c = ra \Rightarrow c = ra - b \quad \frac{a}{b} = \frac{1}{r} \log^r \Rightarrow a = (\frac{1}{r} \log^r) b$$

$$c = \log_r^r b - b = b (\log_r^r - 1) = -b (1 - \log_r^r) = -b (\log_{\lambda}^1 - \log_r^r)$$

$$= (-\log^a) b \Rightarrow \frac{c}{a} = \frac{-\log^a b \times r}{r \log_r^a} = -r \log_r^a \Rightarrow (\frac{1}{\sqrt{r}})^{\frac{c}{a}} = (r^{\frac{1}{2}})^{\log_r^a}$$

$$\log_r^{r^{\frac{1}{2}}} = \log^{\frac{1}{2}} = \sqrt{a} \checkmark$$