

$$\log_n^m = a \quad \log_{mn}^{\frac{m^2 n}{mn}} = b \quad a > 0 \quad [b] = ?$$

$$\text{پیش فرض} = m = n = 1$$

$$\log_{\frac{1}{1}}^1 = \frac{1}{1} \log_1^1 = \left(\frac{1}{1}\right) \rightarrow \frac{1}{1} = b \rightarrow [b] = (1)$$

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$$\text{الف) } \sqrt{\frac{x}{\log \frac{1}{x}}}$$

$$\log \frac{x}{1} \neq 0 \Rightarrow x \neq 1$$

$$\sqrt{\frac{x}{-\log x}} \rightarrow \frac{x}{-\log x} \geq 0 \Rightarrow x < 1 \rightarrow \text{مربع}$$

$$y = \frac{\log(x^2 - x - 1)}{\sqrt{x^2 - 1} + 1}$$

$$x^2 - x - 1 > 0 \rightarrow (x-1)(x+1)$$

$$\frac{-1 \pm \sqrt{1+4}}{2} \rightarrow (-\infty, -1) \cup (1, +\infty)$$

$$x^2 - 1 > 0 \rightarrow x^2 > 1 \rightarrow x < -1 \text{ (1) } \quad (2) \rightarrow (-\infty, -1) \cup (1, +\infty)$$

$$x \log_a^a + \log_a^{\sqrt{a}} = 1 \rightarrow x = 9 \quad a = ?$$

$$x \log_a^a + \frac{1}{x} \log_a^a \rightarrow \log_a^{a^x} + \log_a^{a^{\frac{1}{x}}} \rightarrow \log_a^{a^{x+\frac{1}{x}}} = 1 \rightarrow \log_a^{1/a} = 1 \rightarrow (1/a)^1 = 1/a \rightarrow 1/a^1 = 1/a \rightarrow a = 1$$

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$$\log x = 0.1x \quad \log x = x$$

$$\left(\log \frac{a}{x}\right)^x + (\log 1)x - (\log 10) \rightarrow (\log_{10}^{10})^x (\log_{10}^{10})^x (\log_{10}^{10})^x + 1 \log_{10}^x x - \log_{10}^{10} \log_{10}^{10}$$

$$x^x - 0.1x^x - 0.1x^x + 0.1x^x = \log_{10}^{10} - \log_{10}^{10} - \log_{10}^{10} \rightarrow 0.1x^x + 0.1x^x - 1.1x^x =$$

$$|x - 1| = \frac{\sqrt{\Delta}}{|a|} \rightarrow \frac{\sqrt{4x^2 + 4(0.1x)(1.1x)}}{0.1x} = \sqrt{\frac{4x^2}{10}} = \frac{2\sqrt{x}}{\sqrt{10}} \Rightarrow \frac{2\sqrt{x}}{\sqrt{10}} = \frac{2\sqrt{x}}{\sqrt{10}}$$

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$$\log_{10}^x = 10 \rightarrow \frac{\log_{10}^x}{\log_{10}^{10}} = 10 \rightarrow \frac{\log_{10}^{10} - \log_{10}^{10}}{\log_{10}^{10} - \log_{10}^{10}} \rightarrow \frac{1 - \log_{10}^{10}}{1 - \log_{10}^{10}} = 0.1 \rightarrow 0.1 \cdot 10 - \frac{1}{10} \log_{10}^{10} = 1 - \log_{10}^{10}$$

$$\log_{10}^x = 1.1 \rightarrow \frac{\log_{10}^x}{\log_{10}^{10}} = 1.1 \rightarrow \frac{\log_{10}^{10}}{\log_{10}^{10} - \log_{10}^{10}} \rightarrow \frac{\log_{10}^{10}}{1 - \log_{10}^{10}} = \frac{1.1 \log_{10}^{10}}{1 - \log_{10}^{10}} = 1.1$$

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$\log_{\frac{10}{r}} = 1.0$ $\log_{\frac{r}{r}} = 1.4$ $\log_{\frac{r}{10}} = ?$ $\frac{\log_{\frac{r}{r}}}{\log_{\frac{10}{r}}} = ? = \frac{\log_{\frac{r}{r}} + \log_{\frac{r}{r}}}{\log_{\frac{10}{r}} + \log_{\frac{r}{r}}} = \frac{1 + 1.4}{1.4 + 1.4}$ $\frac{1.4}{1.4 + 1.4} = \frac{1.4}{2.8} = \frac{1}{2}$ $\log_{\frac{r}{10}} = 2.4$	$\frac{\log_{\frac{10}{r}}}{\log_{\frac{r}{r}}} = \frac{\log_{\frac{10}{r}} - \log_{\frac{r}{r}}}{1.4} = \frac{1.0 - 1.4}{1.4} = -\frac{0.4}{1.4} = -\frac{2}{7}$ $\log_{\frac{r}{10}} = 2.4$
$\log_{\frac{1}{r}} = m$ $\log_{\frac{r}{r}} = ?$ $\rightarrow \log_{\frac{1}{r}} + \log_{\frac{r}{r}} \rightarrow \frac{1}{r} \log_{\frac{r}{r}} + \frac{1}{r} \log_{\frac{r}{r}} = \frac{1}{r} \log_{\frac{r}{r}} + \frac{1}{r} = m$ $\log_{\frac{r}{r}} = \log_{\frac{r}{r}} + \log_{\frac{r}{r}} \rightarrow 1 + \frac{1}{r} \log_{\frac{r}{r}}$ $\rightarrow 1 + \frac{1}{r} (\frac{r}{r} - 1)$ $\rightarrow 1 + \frac{r}{r} - \frac{1}{r} \rightarrow \frac{r}{r} = 1$	$\log_{\frac{r}{r}} = \log_{\frac{r}{r}} + \log_{\frac{r}{r}} \rightarrow 1 + \frac{1}{r} \log_{\frac{r}{r}}$ $\rightarrow 1 + \frac{1}{r} (\frac{r}{r} - 1)$ $\rightarrow 1 + \frac{r}{r} - \frac{1}{r} \rightarrow \frac{r}{r} = 1$
$(\frac{1}{r})^{r-1} = (\frac{r}{r})^{r-1}$ $\log_{\frac{r}{r}} = ?$ $(\frac{1}{r})^{r-1} = (\frac{r}{r})^{r-1} \Rightarrow r^{r-1} = -r-1$ $r^{r-1} + r-1 \rightarrow r^{r-1} + r-1$ $\log_{\frac{1}{r}} = X$ $\log_{\frac{r}{r}} \Rightarrow \frac{r}{r} \log_{\frac{r}{r}} = \frac{r}{r}$	$\log_{\frac{r}{r}} = \log_{\frac{r}{r}} + \log_{\frac{r}{r}} \rightarrow 1 + \frac{1}{r} \log_{\frac{r}{r}}$ $\rightarrow 1 + \frac{1}{r} (\frac{r}{r} - 1)$ $\rightarrow 1 + \frac{r}{r} - \frac{1}{r} \rightarrow \frac{r}{r} = 1$
$\log_{\frac{r}{r}} = a$ $\log_{\frac{r}{r}} = \frac{r}{r} (1+a)$ $\log_{\frac{r}{r}} = ?$ $\log_{\frac{r}{r}} = \frac{r}{r} \Rightarrow \frac{r}{r} = b \rightarrow r = b$ $r = r$ $\rightarrow \log_{\frac{r}{r}} = \log_{\frac{r}{r}} = \log_{\frac{r}{r}}$	$\log_{\frac{r}{r}} = \log_{\frac{r}{r}} + \log_{\frac{r}{r}} \rightarrow 1 + \frac{1}{r} \log_{\frac{r}{r}}$ $\rightarrow 1 + \frac{1}{r} (\frac{r}{r} - 1)$ $\rightarrow 1 + \frac{r}{r} - \frac{1}{r} \rightarrow \frac{r}{r} = 1$
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