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$$\log_n^m = a \rightarrow n^a = m^x$$

$$\log_{mn}^{m^2n} = b \rightarrow \log_{mn}^{m^2n} = \log_{mn}^m + \log_{mn}^{n^2} = b \rightarrow \log_{mn}^m = b-1 \rightarrow \log_{n^a}^{n^a} = b-1$$

$$\rightarrow \log_{n^{a+1}}^{n^a} = b-1 \rightarrow b-1 = \frac{a}{a+1} \rightarrow \text{از این جا } a > 0$$

$$[b] = 1 \leftarrow b = 1/2 \dots \leftarrow \frac{a}{a+1} = \dots \leftarrow \frac{a+1}{a+1} = 1$$

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الف)  $\int \sqrt{\frac{x}{\log^m x}} dx \rightarrow \frac{x}{\log^m x} \geq 0 \rightarrow 0 < x < 1 \rightarrow \text{نه (ا)}$

در صورتی که  $\log x > 0$  باشد یعنی  $x > 1$  در این صورت  $\frac{x}{\log^m x} > 0$  است.

ب)  $\int \frac{x^{n^2-n-2}}{\sqrt{x^2-1} + 1} dx$

$x^2-1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \geq 1$  یا  $x \leq -1$

$n^2-n-2 > 0 \rightarrow (n-2)(n+1) > 0 \rightarrow n > 2$  یا  $n < -1$

$\int \frac{1}{(-\infty, -1) \cup (2, +\infty)}$

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۲  $\log_a^a + \log_a^{\sqrt{a}} = 2 \xrightarrow{a^x = y} \log_a^a + \log_a^{\sqrt{a}} = 2 \rightarrow \log_a^a + \frac{1}{\log_a^a} = 2$

$\rightarrow \log_a^a + \frac{1}{\log_a^a} = 2 \rightarrow (\log_a^a)^2 - 2 \log_a^a + 1 = 0 \rightarrow (\log_a^a - 1)^2 = 0 \rightarrow \log_a^a = 1 \rightarrow a = 2$

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$\log_r^r = 1$   $\log_r^r = 1/5 \rightarrow \log_r^a = \frac{1}{r} = 2$

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

$= 0/1 \cdot 2^r + 0/1 \cdot 2 - 1/1 = 0 \rightarrow 2^{r+1} + 1 \cdot 2 - 1 = 0 \rightarrow 2^{r+1} + 1 = 0 \rightarrow 2^{r+1} = -1$

$\rightarrow 2 = \frac{-1}{r} \rightarrow r = \frac{-1}{2}$

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$\log_r^r = 1/11$   $\log_r^r = 1/5 \rightarrow \log_r^a = \frac{1}{r} = 2$

$\log_{1/2}^1 = \frac{\log_r^1}{\log_r^{1/2}} = \frac{\log_r^{a^2}}{\log_r^{a^2}} = \frac{\log_r^a + \log_r^r}{\log_r^a + \log_r^r} = \frac{2+1}{2/11+1} = \frac{3}{c/11} = \frac{c}{11}$

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