

$$\log_m^n = a \quad \log_{mn}^{m^n} = b \rightarrow = 1 + \log_{mn}^m$$

$$\rightarrow = 1 + \frac{1}{\log_{mn}^m} = 1 + \frac{1}{\log_m^n + 1} = 1 + \frac{1}{1 + \frac{1}{a}}$$

$$\rightarrow = \frac{2a+1}{a+1} = b \xrightarrow{a>0} \frac{2(a+1)-1}{a+1} = b \rightarrow \text{یعنی } b \text{ یکی کمتر از } 1 \text{ است.}$$

$$\rightarrow [b] = 1 \checkmark$$

$$\text{الف) } y = \sqrt{\frac{n}{\log_{\frac{n}{2}}^n}} \quad \text{① } \log_{\frac{n}{2}}^n \neq 0 \rightarrow n \neq 1 \quad \text{③ } \frac{0}{0+0} -$$

$$\text{② } n > 0$$

$$\rightarrow Dy = (0, 1) \checkmark$$

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

$$\text{① } n^2 - 1 \geq 0 \rightarrow \frac{-1}{\pm 1 - 1} \rightarrow n \geq 1 \quad n \leq -1$$

$$\text{② } \sqrt{n^2 - 1} + 1 \neq 0 \rightarrow \checkmark$$

$$\text{③ } n^2 - n - 2 > 0 \rightarrow \frac{-1}{\pm 1 - 1} \rightarrow n > 2 \quad n < -1 \rightarrow Dy = (-\infty, -1) \cup (2, \infty) \checkmark$$

$$2 \log_a^n + \log_a^{\sqrt{n}} = 2 \xrightarrow{n=a} \log_a^{a^2} + \log_a^a = 2$$

$$\rightarrow \log_a^{a^2} + \frac{1}{\log_a^{a^2}} = 2 \xrightarrow{\log_a^{a^2} = t} t + \frac{1}{t} = 2 \rightarrow t = 1$$

$$\rightarrow \log_a^{a^2} = \log_a^a = 1 \rightarrow a = 3^1 = 3 \checkmark$$

$$\log 2 \approx 0,3 \quad \log 2 \approx 0,4 \rightarrow \log 2 = 1 - \log 2 \approx 0,7$$

$$\rightarrow \log 12 = 0,4 + 0,7 = 1,1 \quad \log 9 = 0,1$$

$$\log \frac{9}{4} = 0,7 - 0,4 = 0,3 \rightarrow 0,3n^2 + 0,1n - 1,1 = 0$$

$$\rightarrow 3n^2 + n - 11 = 0 \xrightarrow{\text{اختلاف}} \frac{\sqrt{\Delta}}{2a} = \frac{\sqrt{44+132}}{6} = \frac{14}{3} \checkmark$$

$$\log_2^4 = 2,1 \quad \log_2^2 = 0,4 \quad \log_{16}^{10} = ?$$

$$\rightarrow \log_{16}^{10} = \frac{1}{\log_{16}^{10}} = \frac{1}{\log_2^4 + \log_2^2} \times$$

$$\log_2^2 = 2 \rightarrow \log_2^{10} = 2$$

$$\rightarrow \log 2 = \frac{1}{2} \times \quad \log_{10}^4 = \frac{\log_2^4}{\log_2^{10}} = \frac{2,1}{2} = \frac{14}{12}$$

$$\rightarrow \log_{16}^{10} = \frac{1}{\frac{1}{2} + \frac{14}{12}} = \frac{1}{\frac{19}{12}} = \frac{12}{19} \checkmark$$

$\log_r \Delta = 1, \Delta$ $\log_r^r = 1, 4$ $\log_{10}^r = ?$ $\log_r^r = \frac{1}{1,4} \rightarrow \log \Delta = \frac{\log \Delta}{\log_r^r} = \frac{1, \Delta}{\frac{1}{1,4}} = 1, \Delta \times 1,4 = 1,4$ $\rightarrow \log_{10}^r = 1,4 + 1,4 = 2,8$ * $\log_r^r = 1,4 + 1 = 2,4$ $\rightarrow \log_{10}^r = \frac{\log_r^r}{\log_{10}^r} = \frac{1,4}{1,4} = \frac{1,4}{1,4} = 1,0$ ✓	2 6
$\log_{10}^r = m$ $\log_r^r = ?$ $m = \log_{10}^r + \log_{10}^r = \frac{1}{r} + \frac{r}{r} \log_r^r$ * $\log_r^r = \frac{1}{r} \log_r^r = \frac{1}{r} (\log_r^r + \log_r^r) = 1 + \frac{1}{r} \log_r^r$ $\rightarrow \frac{r}{r} \log_r^r = m - \frac{1}{r} = \frac{rm-1}{r} \rightarrow \log_r^r = \frac{rm-1}{r}$ $\rightarrow \log_r^r = 1 + \frac{rm-1}{r} = \frac{rm+r}{r}$! دقة ✓	1,4 7
$(0,4)^{rm-1} = \left(\frac{1,4}{1}\right)^{rm-1} \rightarrow \left(\frac{r}{\Delta}\right)^{rm-1} = \left(\frac{\Delta}{r}\right)^{rm-1}$ $\rightarrow \left(\frac{r}{\Delta}\right)^{rm-1} = \left(\frac{\Delta}{r}\right)^{-rm+1} = \left(\frac{\Delta}{r}\right)^{rm-1} \rightarrow rm-1 = -rm+1$ $\rightarrow n = \frac{-1 \pm \sqrt{1+11}}{4} < \begin{matrix} n=-1 \\ n=\frac{1}{r} \end{matrix} \rightarrow \log_{10}^{-1} \propto$ $\rightarrow \log_{10}^r = \frac{r}{r}$ ✓	2 8
$\log_r^r = a$ $\log_{10}^r = \frac{r}{r} (1+a)$ $\log(10-1) = ?$ $\rightarrow 1+a = \log_r^r \rightarrow \frac{r}{r} (\log_r^r) = \log_{10}^r = \log_{10}^r$ $\rightarrow b = 10 \rightarrow \log(10-1) = \log 9 = 2$ ✓	2 9
$-fan^r + bn + \frac{1}{r}c = 0$ $\frac{rfa}{b} = \log r$ $ra = b + c \rightarrow b = ra - c \rightarrow \frac{rfa}{ra-c} = \log r$ $\rightarrow \frac{ra}{ra-c} = \log r \rightarrow \frac{ra-c}{ra} = \log_{10}^r = 1 - \frac{c}{ra}$ $\rightarrow \frac{c}{ra} = \log_{10}^r \rightarrow \frac{c}{a} = \log_{10}^r \rightarrow \left(\frac{1}{\frac{ra}{r}}\right) \frac{c}{a}$ $= r^{-\frac{1}{n}} \cdot \log_{10}^r = 0,10^r = \frac{1}{10} = r \Delta^{\frac{1}{r}} = \Delta^{\frac{1}{r}}$ ✓	2 10