

17

$$x^r = r^{A+B} \rightarrow x=1 \rightarrow 1 = r^{A+B} \rightarrow A+B=0 \text{ (1)}$$

$$\hookrightarrow x=c \rightarrow c^r = r^{cA+B} \rightarrow A+B=r \text{ (2)}$$

$$\left. \begin{matrix} A+B=0 \\ A+B=r \end{matrix} \right\} \rightarrow \begin{matrix} A = \frac{1}{r} \\ B = -\frac{1}{r} \end{matrix} \rightarrow f(x) = r^{\frac{1}{r}x - \frac{1}{r}}$$

تقریباً $f(x)$ $\Rightarrow r^{-\frac{1}{r}} = \sqrt[r]{\frac{1}{r}}$ جواب *

$$f(0) = r^B = r^{-1} = \frac{1}{r}$$

20

$$r^{x+r} = \varepsilon^x + 1 \Rightarrow r^x \times r = r^x + 1 \Rightarrow r^x - 1 + r^x + 1 = 0 \xrightarrow{r^x = t} (t-r)(t+1) = 0$$

$$\left\{ \begin{matrix} t=r = r^x \rightarrow \log_r r = x \\ t=1 = r^x \rightarrow \log_r 1 = x \end{matrix} \right. \left\{ \begin{matrix} \log_r 1 = \log_r r + \log_r r = \log_r r \end{matrix} \right.$$

$$\frac{(\log_r r)(\log_r r)}{a} + \frac{(\log_r r^x)(\log_r r^r)}{a} = \frac{\log_r r = b}{\log_r r = a} (rb+ra) = \varepsilon a^r + \lambda ab + \varepsilon b^r = \frac{\varepsilon(a^r + rab + b^r)}{a^r}$$

$$\varepsilon(a^r + rab + b^r) =$$

$$\varepsilon(a+b)^r = r$$

جواب *

$$\log (x^{r-2x+1})(1-x)^r = \log 10 \Rightarrow 10 = (1-x)^r (1-x)^r \Rightarrow (1-x)^{2r} = 10 \Rightarrow x = -9$$

$$\hookrightarrow -x = 9$$

$$\Rightarrow \log 9 = \boxed{2}$$

جواب *

$$\log (x^r + rx + \varepsilon)(x-r) = \log 1 \Rightarrow (x^r + rx + \varepsilon)(x-r) = 1 \xrightarrow{\text{فرض کنیم}} x^r - 1 = 1$$

$$\hookrightarrow x^r = 2$$

$$\hookrightarrow x = \sqrt[r]{2}$$

$$\log_{\sqrt[r]{2}} \sqrt[r]{2} = \boxed{1}$$

جواب *

$$\log \frac{(r-x)}{t} - \log \frac{1}{(r-x)^r} = r \Rightarrow \log t - \log \frac{1}{t^r} = \log \frac{t}{t^r} = \log t^{-r} = \log_{10} t^{-r} = r \Rightarrow 10^r = t^{-r} \Rightarrow \boxed{t=10}$$

$$r-x=10 \rightarrow \boxed{-x=1} \Rightarrow \log \sqrt{r} = \boxed{\frac{1}{2}}$$

جواب *

6

$$\mu x^{r-t} = \mu \epsilon x \rightarrow x^r - \epsilon x - t = 0 \rightarrow \Delta = 2\sqrt{9} \rightarrow \begin{cases} x_1 = 2 + \sqrt{9} \checkmark \text{ صحیح} \\ x_2 = 2 - \sqrt{9} \neq 0 \times \text{ غلط} \end{cases}$$

$$\log \frac{x-r}{4} = \log \frac{2+\sqrt{9}-2}{4} = \log \frac{\sqrt{9}}{4} = \log \frac{3}{4} = \boxed{\frac{1}{2}}$$

جواب *

7

$$\log_{11}^1 = \frac{\log_{11}^1}{\log_{11}^1} = \frac{\log_{11}^r}{\log_{11}^{9 \times r}} = \frac{\log_{11}^r}{\log_{11}^9 + \log_{11}^r} = \frac{r \times \frac{1}{9}}{r + \frac{1}{9}} \Rightarrow \frac{10}{21} = \boxed{\frac{9}{11}}$$

جواب *

8

$$\log_{11}^4 = \frac{\log_{11}^4}{\log_{11}^r} = \frac{\log_{11}^r + \log_{11}^r}{\log_{11}^r + \log_{11}^r} = \frac{\frac{1}{r} + \frac{1}{10}}{1 + \frac{1}{10}} = \boxed{\frac{10}{11}}$$

جواب *

9

$$\log_{11}^4 = \frac{1}{\log_{11}^r} = \frac{1}{\log_{11}^r + \log_{11}^4} = \frac{1}{\frac{1}{\log_{11}^r} + 1} = \frac{1}{\frac{1}{11} + 1} = \frac{11}{12}$$

$$x=-1 \rightarrow a \log r - a + b \log r = 0 \Rightarrow a - a \log r = b \log r \Rightarrow a(1 - \log r) = b \log r \Rightarrow$$

$$\frac{b}{a} = \frac{1 - \log r}{\log r} = \frac{1}{\log r} - 1 \Rightarrow (\sqrt{r}) \frac{1}{\log r} - 1 = r \frac{1}{\log r} - 1 \Rightarrow r \frac{1}{\log r} - \frac{1}{r} = \frac{1}{\log r} - \frac{1}{r}$$

$$\frac{1}{\log r} = \log_{10}^1, \quad r \log_{10}^1 = 10 \Rightarrow r \frac{1}{\log r} = \sqrt{10} \rightarrow r \frac{1}{\log r} - \frac{1}{r} = \sqrt{\frac{10}{r}} = \boxed{\sqrt{10}}$$

جواب *

$$\boxed{\sqrt{a}}$$

10