

$$r^{A+B} = 1$$

$$r^{rA+B} = 9$$

$$r^{rA} = 9$$

$$rA = r$$

$$A = 1$$

$$r^{A+B} = r^0$$

$$A+B = 0$$

$$B = -1$$

$$r^{x-1} \stackrel{x=0}{\implies} r^{-1} = \boxed{\frac{1}{r}}$$

-1

$$r^{x+c} = r^x + 10 \quad r^x = z \quad \Delta z = z + 10 \quad z^r - \Delta z + 10 = 0 \quad (z-c)(z-\Delta) = 0$$

$$\log_r r + \log_r \Delta = \log_r 10$$

$$z=c \quad z=\Delta$$

$$r^x=c \quad r^x=\Delta$$

$$x=\log_r c \quad x=\log_r \Delta$$

-2

$$(\log_r r)^r + (-1 + \log_r \Delta) (r + \log_r r)$$

$$= (\log_r c)^r + r + \log_r \Delta + r \log_r \Delta + \log_r \Delta \log_r r$$

$$(\log_r c)^r + \log_r \Delta + \log_r \Delta \log_r r + c$$

$$\log 1-x = z \quad rz + cz = \Delta \quad z=1 \quad \log 1-x = 1 \quad 1-x=10 \quad x=-9$$

-3

$$\log_r 9 = r$$

$$(x^r + rx + r)(x-r) = \Delta$$

$$x^c - rx + rx - rx + rx - \Delta = \Delta$$

$$x^c = 10 \quad x = \sqrt[10]{10}$$

$$\log_{\frac{\sqrt{10}}{r}} = r$$

-4

$$\log r - x = z \quad z + rz = r$$

$$z = 1$$

$$\log \frac{\Delta}{\sqrt{r}} = r$$

-5

$$\log r - x = 1 \quad r - x = 10 \quad x = -9$$

$$x^r - r = rx$$

$$x^r - rx - r = 0$$

$$x = \frac{r + \sqrt{r^2 + 4r}}{2} = r + \sqrt{r}$$

$$x = \frac{r - \sqrt{r^2 + 4r}}{2} \quad \text{سه سه}$$

$$\log_{\frac{r + \sqrt{r} - r}{r}} = \frac{1}{r}$$

-6

$$\log_{1/r} \Delta = \frac{\log_c \Delta}{\log_r \Delta} = \frac{r \log_r \Delta}{r + \log_r \Delta} = \frac{\frac{10}{r}}{\frac{r}{r}} = \frac{\Delta}{r}$$

-7

$$\log_{1/r} r = \frac{\log_r r}{\log_r r} = \frac{1 + \log_r r}{r + \log_r r} = \frac{1 + 1/r}{r + 1/r} = \frac{r/r + 1/r}{r^2/r + r/r} = \frac{r+1}{r^2+r} = \frac{r}{r^2+r}$$

-8

$$\log_r c = \frac{1}{r} \log_r c = 0,1 \quad \log_r c = 1,1$$

-9

$$a \log r - a + b \log r = 0$$

$$\log r - 1 + \frac{b}{a} \log r = 0$$

$$(\sqrt{r})^{\log_r \Delta} = \Delta \quad \log_r \sqrt{r} = \frac{1}{2}$$

$$\frac{b}{a} = \frac{1 - \log r}{\log r} = \frac{\log \Delta}{\log r} = \log_r \Delta$$

-10