

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

$$= \frac{1}{1/4 + 1/4} + \frac{1}{1 + 1/4} = \frac{1}{1/2} + \frac{1}{5/4} = \frac{1}{1/2} + \frac{4}{5} = \frac{2}{1} + \frac{4}{5} = \frac{2+4}{1} = \frac{6}{1} = \boxed{\frac{6}{1}}$$

$$\therefore \log_{10}^r = \frac{\log_{10}^r}{\log_{10}^r} = \frac{1/4}{1/4} = \frac{1/4}{1/4} = \frac{1/4}{1/4} = \frac{1}{1} = 1$$

5)

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$$\log_{10}^r = m \Rightarrow \frac{1}{r} \log_{10}^r = m \Rightarrow \log_{10}^r + \log_{10}^r = 2m \Rightarrow 1 + 2 \log_{10}^r = 2m$$

$$\Rightarrow \log_{10}^r = \frac{2m-1}{2}$$

$$\log_{10}^r = \log_{10}^r + \log_{10}^r = 1 + \frac{1}{r} \log_{10}^r = 1 + \frac{2m-1}{r} = \frac{r+2m-1}{r}$$

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$$\left(\frac{r}{a}\right)^{rx-1} = \left(\left(\frac{a}{r}\right)^r\right)^{rx} \Rightarrow \left(\frac{a}{r}\right)^{1-rx} = \left(\frac{a}{r}\right)^{rxr} \Rightarrow 1-rx = rxr \Rightarrow rxr + rx - 1 = 0$$

$$\Rightarrow x_1 = -1 \quad \text{---} \quad \text{---} \quad \text{---} \quad (9x+1 > 0)$$

$$x_2 = -\frac{c}{a} = -\frac{1}{r} \quad \Rightarrow \log_{10}^{(9x+1)} = \frac{1}{r} \log_{10}^{(9x+1)} = \frac{1}{r} \log_{10}^r = \frac{r}{r} = \boxed{\frac{r}{r}}$$

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$$\log_{10}^b = \frac{1}{r} \log_{10}^b = \frac{r}{r} (1 + \log_{10}^r) \Rightarrow \log_{10}^b = r + r \log_{10}^r = \log_{10}^r + \log_{10}^r = \log_{10}^{2r}$$

$$\Rightarrow b = 2r \Rightarrow \log_{10}^{(rb-1)} = \log_{10}^{(10r-1)} = \log_{10}^{100} = \boxed{2}$$

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$$\frac{1}{s} = \log_{10}^r \Rightarrow \frac{ra}{b} = r \log_{10}^r \Rightarrow \frac{ra}{b} = \log_{10}^r \Rightarrow \frac{a}{b} = \frac{\log_{10}^r}{r}$$

$$a = \frac{b+c}{r} \Rightarrow ra = b+c \Rightarrow b \times \log_{10}^r = b+c \Rightarrow \log_{10}^r = 1 + \frac{c}{b} \Rightarrow \frac{c}{b} = \log_{10}^r - 1$$

$$\frac{c}{a} = \frac{\frac{c}{b}}{\frac{a}{b}} = \frac{\log_{10}^r - 1}{\frac{1}{r} \log_{10}^r} = \frac{\log_{10}^r - \log_{10}^1}{\log_{10}^r} = \frac{\log_{10}^r - \log_{10}^1}{\log_{10}^r} = -\log_{10}^{\frac{1}{r}} = -\log_{10}^{\frac{1}{r}} = \log_{10}^{\frac{1}{r}}$$

$$\left(\frac{1}{\sqrt{r}}\right)^{\frac{c}{a}} = \left(r^{-\frac{1}{2}}\right)^{\log_{10}^{\frac{1}{r}} \frac{1}{r}} = \left(\frac{1}{\omega}\right)^{\log_{10}^{\frac{1}{r}} \frac{1}{r}} = \left(\frac{1}{\omega}\right)^{-\frac{1}{r}} = \left(\frac{1}{\omega}\right)^{-\frac{1}{r}} = \omega^{\frac{1}{r}} = \boxed{\sqrt[r]{\omega}}$$

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