

1. Compute

$$1. \sum_{i=-10}^n \left(\frac{1}{2}\right)^i + \sum_{i=200}^{n^2} (3)^i$$

$$\begin{aligned} \sum_{i=-10}^n \left(\frac{1}{2}\right)^i + \sum_{i=200}^{n^2} (3)^i &= \sum_{i=-10}^{-1} \left(\frac{1}{2}\right)^i + \sum_{i=0}^n \left(\frac{1}{2}\right)^i + \sum_{i=0}^{n^2} (3^i) - \sum_{i=0}^{199} (3^i) \\ &= \sum_{i=-10}^0 \left(\frac{1}{2}\right)^i - \sum_{i=0}^0 \left(\frac{1}{2}\right)^i + \sum_{i=0}^{n^2} (3^i) - \sum_{i=0}^{199} (3^i) \\ &= -\sum_{i=0}^{10} \left(\frac{1}{2}\right)^i - 1 + \frac{3^{n^2+1} - 1}{3 - 1} - \frac{3^{200} - 1}{3 - 1} \\ &= -\frac{\left(\frac{1}{2}\right)^{11} - 1}{\frac{1}{2} - 1} - 1 + \frac{3^{n^2+1} - 1}{3 - 1} - \frac{3^{200} - 1}{3 - 1} \end{aligned}$$

$$2. 7^{\log_2 \log_2 4} + \log_3 \log_2^2 8$$

$$\begin{aligned} 7^{\log_2 \log_2 4} + \log_3 \log_2^2 8 &= 7^{\log_2 2} + \log_3 9 \\ &= 7 + 2 \\ &= 9 \end{aligned}$$