

$$\begin{aligned}
 2) \quad \sum_{i=0}^n (-1)^i &= (-1)^0 + (-1)^1 + (-1)^2 + \dots + (-1)^n \\
 &= 1 - 1 + 1 - 1 + \dots + (-1)^n
 \end{aligned}$$

$$\begin{aligned}
 b) \quad \sum_{j=0}^n 3j &= 3 \cdot 0 + 3 \cdot 1 + 3 \cdot 2 + \dots + 3n \\
 &= 0 + 3 + 6 + 9 + \dots + 3n
 \end{aligned}$$

$$c) \quad \sum_{k=1}^n n = n \cdot \sum_{k=1}^n 1 = n \cdot n = n^2$$

$$= \underbrace{n + n + \dots + n + n}_{n \text{ fois}}$$

$$d) \quad \sum_{i=1}^n \frac{n}{i} = n \cdot \sum_{i=1}^n \frac{1}{i} = n \cdot \left(1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n} \right)$$

$$= \left(n + \frac{n}{2} + \frac{n}{3} + \dots + \frac{n}{n-1} + 1 \right)$$