3a) i) $c=0$: $\sum_{k=0}^{n} c\cdot q^k = 0$; $\sum_{k=0}^{\infty} c\cdot q^k = 0$

ii) $c\neq 0$: $$\sum_{k=0}^{n} c\cdot q^k = \begin{cases} c\cdot \frac{1-q^{n+1}}{1-q} & \text{falls } q\neq 1 \\ c\cdot (n+1) & \text{falls } q=1 \end{cases}$$

$$\sum_{k=0}^{\infty} c\cdot q^k = \begin{cases} \frac{c}{1-q} & \text{falls } q\in(-1,1) \\ \text{nicht konvergent} & \text{sonst} \end{cases}$$

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b) i) $c=0$: $\sum_{k=1}^{n} c\cdot q^k = 0$; $\sum_{k=1}^{\infty} c\cdot q^k = 0$

ii) $c\neq 0$:

$$\sum_{k=1}^{n} c\cdot q^k = \begin{cases} c\cdot \frac{q-q^{n+1}}{1-q} & \text{falls } q\neq 1 \\ c\cdot n & \text{falls } q=1 \end{cases}$$

$$\sum_{k=1}^{\infty} c\cdot q^k = \begin{cases} \frac{c\cdot q}{1-q} & \text{falls } q\in(-1,1) \\ \text{nicht konvergent} & \text{sonst} \end{cases}$$