

$$b) \sum_{k=1}^n k^2 = \frac{n(n+1)(2n+1)}{6}$$

$$\boxed{n=1} \quad \sum_{k=1}^1 1^2 = 1 = \frac{1 \cdot 2 \cdot 3}{6} \quad \checkmark$$

$$\boxed{n \checkmark \Rightarrow n+1 \checkmark}$$

$$\sum_{k=1}^{n+1} k^2 = \sum_{k=1}^n k^2 + (n+1)^2$$

$$= \frac{n(n+1)(2n+1)}{6} + \frac{6(n+1)(n+1)}{6}$$

↑
hyp. de réc.

$$= \frac{(n+1)(2n^2+n+6n+6)}{6}$$

$$= \frac{(n+1)(2n^2+7n+6)}{6}$$

$$= \frac{(n+1)(2n+3)(n+2)}{6}$$

$$= \frac{(n+1)(2 \cdot (n+1) + 1)(n+1+1)}{6}$$

$$= \frac{(n+1) \cdot (n+1+1) \cdot (2(n+1)+1)}{6}$$

CQFD