

5. Ind. Anfang $n=1$

$$\text{linke } S = \sum_{k=1}^1 \left(k - \frac{1}{2}\right) = 1 - \frac{1}{2} = \frac{1}{2} \quad \text{rechte } S = \frac{1^2}{2} = \frac{1}{2} \quad \checkmark \quad (1)$$

$$\text{Ind. Vorauss.} \quad \sum_{k=1}^n \left(k - \frac{1}{2}\right) = \frac{n^2}{2} \quad (1)$$

$$\text{Ind. Behauptung} \quad \sum_{k=1}^{n+1} \left(k - \frac{1}{2}\right) = \frac{(n+1)^2}{2} \quad (1)$$

$$\text{Beweis:} \quad \sum_{k=1}^{n+1} \left(k - \frac{1}{2}\right) = \sum_{k=1}^n \left(k - \frac{1}{2}\right) + n+1 - \frac{1}{2} \quad (1)$$

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

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

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

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

6