

Tutorial 3

Instructions: In each of the problems below, your task is to:

1. Find the closed form for the sum using strategies from class.
2. Prove by induction that your closed form is correct.

1. Linearity

Let $S_n = \sum_{i=1}^n (6 + 5i)$.

- (a) Compute a closed form for S_n .

- (b) Prove your closed form is correct by induction on n .

Let $S_n = \sum_{j=1}^n (4j-2)(n-j+1)$.

- 2

3. Geometric Series

Let $T_n = \sum_{k=0}^n 2 \cdot 3^k$.

(a) Compute a closed form for T_n .

(b) Prove by induction that $T_n = 3^{n+1} - 1$.

4. Double Sums

Let $U_n = \sum_{i=1}^n \sum_{j=1}^i (8j - 3)$.

Compute a closed form for U_n .