

ITT9132 Concrete Mathematics
Exercise session 4: 18 February 2021

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Exercise 2.6

What is the value of $\sum_k [1 \leq j \leq k \leq n]$ as a function of j and n ?

Exercise 2.14

Use multiple sums to evaluate

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

Exercise 2.15

Evaluate $\boxplus_n = \sum_{k=1}^n k^3$ by the text's Method 5 as follows: First write $\boxplus_n + \square_n = 2 \sum_{1 \leq j \leq k \leq n} jk$; then apply (2.33).

Exercise 2.21(b)-(c)

For $n \geq 0$ evaluate the following sums by the perturbation method:

1. $T_n = \sum_{k=0}^n (-1)^{n-k} k.$

2. $U_n = \sum_{k=0}^n (-1)^{n-k} k^2$

Hint: use the following sum, which we calculated in the previous session:

$$S_n = \sum_{k=0}^n (-1)^{n-k} = [n \text{ is even}]$$