Exercises.

2.0 Review your studies on induction on numbers (high school textbooks, Formale Methoden I & II) and Theorem 2.2.3 & 2.2.4 in the book on p. 11–12.

2.1 Show $R \cup (S \cap T) = (R \cup S) \cap (R \cup T)$ formally. (The review of the definitions of union and intersection are part of the exercise.)

2.2 Show by induction on n:

$$\text{for all } n \geq 4 : n^2 \geq 2n + 1 \ .$$

2.3 Show by induction on n:

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

2.4 Show by structural induction: Each expression (as defined in the lecture) contains exactly as many left as right brackets.

2.5 Show the missing base cases and step-cases in the mutual induction proof in the lecture.

Optional Exercises.

1. Exercise 2.2.1
2. Exercise 2.2.2
3. Exercise 2.2.3