

# Introduction (9/29/23)

## Sets of Numbers

First examine the natural numbers. It is very common knowledge that 1 is a natural number and you obtain the rest by increasing the previous by 1. This is however not a rigorous construction of the natural numbers. An example of a rigorous construction is the **Peano axioms**

**Remark** (Peano Axioms).    1.  $1 \in \mathbb{N}$

2. If  $n \in \mathbb{N}$ , then  $n + 1 \in \mathbb{N}$

3. 1 is the first element, meaning it is not the successor of any element

4. If  $S \subset \mathbb{N}$  such that  $1 \in S$  and  $n \in S$  implies  $n + 1 \in S$ , then  $S = \mathbb{N}$