

signed number  
size  
plain number  
quantitative  
sign  
qualitative

## Chapter 1

# Qualitative Analysis

Sign and Size, 1 – Quantitative Rulers, 2 – Comparing Numbers, 3 – Finite Numbers, Infinite Numbers, and Infinitesimal Numbers, 4 – Neighborhoods, 5 – Qualitative Rulers, 7 – Zero, 8 – Infinity, 9 – Computational Definitions for Qualitative Sizes, 12 – Multiplication and Division of Signs, 13 – Multiplication and Division of Sizes, 13.

In this chapter, we revisit a number of concepts about *numbers* which the reader probably already encountered in one form or the other but which s/he should nevertheless carefully study, “pencil in hand”, because here they will be discussed in terms of how we will use them throughout this text.

### 1.1 Sign and Size

A **signed number** carries two very different pieces of information:

- a **size**, namely a **plain number**, that is an unsigned number, which is the **quantitative** part of the feature in that it indicates “how much” of the feature there is.  
**NOTE.** Instead of the word “size”, textbooks mostly use “absolute value” but, sometimes, “numerical value” or “modulus” or “norm”. None of these words will be used in this text.
- a **sign**, namely + or –, which is the **qualitative** part of a “feature” in that it indicates “which way” the feature is going.