

Real Numbers

In this chapter we shall introduce the set of real numbers and give its structure as a "complete ordered" field. Then we discuss "the Archimedean property" of real numbers and "the modulus of a real algorithm" several properties. We begin this chapter with some set-theoretic concepts.

2.1 Set

A set is a well defined collection of objects. The objects of the ^{set} are called elements or members of the set. Capital letters X, Y, S, T , etc generally denote sets, while small letters x, y, s, t etc denote elements of a set. If x is an element of a set S then we write $x \in S$ and read it as x belongs to S or x is a member of S ; if x is not an element of a set S , then we write $x \notin S$ and read it as x does not belong to S or x is not a member of S .

A set having no element is called an empty set or a null set. It is denoted by ϕ .

A non-empty set S , written as $S \neq \phi$, is a set which has at least one element.

A set is said to be finite or infinite according as it has finite or infinite number of elements.