
2. Comparison of sets. The definition of cardinality as an equivalence class over equinumerousity. The Cantor-Bernstein theorem. Cantor’s theorem on the cardinality of the power-set.


5. The construction of the ordered real line as a quotient over Cauchy sequences of rationals.

6. König’s lemma on countably infinite trees with finite levels. Applications. A countable graph is k-colorable iff every finite subgraph of it is k-colorable.

7. Well ordering. Isomorphisms between well-ordered sets. The axiom of choice formulated as the well-ordering principle. Example. Applications. An arbitrary graph is k-colorable iff every finite subgraph is k-colorable.


11. Infinite cardinals as initial ordinals. Basic cardinal arithmetic. Cardinalities of well known sets. Continuous real functions, all real functions, the automorphisms of the real field (with and without order).