Banach limits

Bachelor thesis abstract

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Banach limit is a continuous linear functional on the Banach space of real bounded sequences, which naturally extends the limit – in particular, it is positive and translation invariant. In this thesis we construct Banach limits with some additional properties and subquently give examples of their use in several proofs from measure theory and functional analysis. Using the theory of Banach limits, the existence of Lebesgue measure and the Josefson-Nissenzweig theorem are proven, the former being an original work of the author.