ON INJECTIVE BANACH SPACES AND THE SPACES $L^\infty(\mu)$ FOR FINITE MEASURES μ

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Introduction

We are interested here in the linear topological properties of those Banach spaces associated with injective Banach spaces. We study in particular detail, the spaces $L^\infty(\mu)$ for finite measures μ, and obtain applications of this study to problems concerning injective Banach spaces in general.(2) (Throughout the rest of this introduction, "μ" and "ν" denote arbitrary finite measures on possibly different unspecificed measureable spaces).

For example, we classify the spaces $L^\infty(\mu)$ themselves up to isomorphism (linear homeomorphism) in § 3, and all their conjugate spaces $((L^\infty(\mu))^*$, $(L^\infty(\mu))^{**}$, $(L^\infty(\mu))^{***}$, etc.)

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(2) It is easily seen that if λ is a σ-finite measure, then there exists a finite measure μ with $L^p(\lambda)$ isometric to $L^p(\mu)$ for all p, $1 \leqslant p \leqslant \infty$. Thus all of our results concerning finite measures generalize immediately to σ-finite measures.