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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% LIST OF THEOREMS FOR THE EXAM %%%%%%%%%%%%%%%%%%%%%%%
% Explanation:
%  the number at the end of line = the number of the theorem in the lecture notes
%  the sign before the number:
%        *   these theorems are not explicitly included into
%            the exam questions. Anyway, the knowledge is assumed,
%            including the idea of a proof (in case the theorem
%            was proved during the lectures).
%        +   "difficult theorem" included with this status
%            to exam questions
%  no sign   "easy theorem" included with this status
%            to exam questions
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
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%
%%% Chapter V
%
description of the convex, balanced and absolutely convex hull % * V.2
generating the linear topology using a neighborhood base % + V.3 and V.4
characterization of continuous linear mappings % V.6
characterization of continuous linear functionals % V.7
relationship of continuous and bounded linear mappings % V.8
properties of HTVS of finite dimension % V.9 and V.10
characterization of finite-dimensional TVS % + V.11
metrizability of TVS % * V.12 and V.13
basic properties of Minkowski functionals % * V.15
on the Minkowski functional of a convex neighborhood of zero % + V.17 including V.16
generating topology using a family of seminorms % V.19 and V.20
metrizability of LCS % * V.22
characterization of normable TVS % V.23
continuity, boundedness and convergence in a topology generated by seminorms % V.24 (incl. V.21)
on absolutely convex hull of a compact set % V.27–V.29
Banach-Steinhaus theorem % V.30
open mapping theorem % + V.31
Hahn-Banach extension theorem and its applications % V.32–V.34
Hahn-Banach separation theorem and its applications % + V.35 and V.36
%
%%% Chapter VI
%
basic properties of abstract weak topologies % * VI.1
dual to an abstract weak topology % VI.3 and VI.4
Mazur theorem % VI.6
boundedness and weak boundedness % + VI.8
weak topology on a subspace % * VI.9
polar calculus % * VI.11
bipolar theorem % VI.12
Goldstine theorem % VI.14
Banach-Alaoglu theorem % + VI.15 and VI.16
reflexivity and weak compactness % VI.17 and VI.18
%

%%% Chapter VII
%
Pettis measurability theorem % + VII.3 including VII.2 (and its variants VII.5 and VII.4)
construction and properties of the Bochner integral % VII.7
characterization of Bochner integrability % VII.8
dominated convergence theorem for Bochner integral % VII.9
on the weak integral % VII.11
Bochner integral and a bounded operator % VII.12
definition and properties of Lebesgue-Bochner spaces % + VII.14
separability of Lebesgue-Bochner spaces % + VII.15
%
%%% Chapter VIII
%
adding a unit to a Banach algebra % VIII.2
renorming a Banach algebra % * VIII.3
on multiplication of invertible elements % VIII.5
Neumann's series and properties of the group of invertible elements % + VIII.6 and VIII.7
properties of the resolvent function % + VIII.8
nonemptiness of spectrum % + VIII.9
Gelfand-Mazur theorem % VIII.10
spectrum and polynomials % VIII.11
formula for the spectral radius % + VIII.12
on spectrum with respect to a subalgebra % + VIII.14 and VIII.15
path integral with values in a Banach space % VIII.16
holomorphic functional calculus % + VIII.17
properties of ideals and maximal ideals % VIII.18
factorization of a Banach algebra % VIII.20
properties of complex homomorphisms and $\Delta(A)$ % + VIII.21 and VIII.22
on maximal ideals and complex homomorphisms % VIII.23
Gelfand transform and its properties % + VIII.24
basic properties of algebras with involution % VIII.26
on spectral radius of a normal element in a C^*-algebra % VIII.27 and VIII.28
adding a unit to a C^*-algebra % * VIII.29
automatic continuity of $*$-homomorphisms % VIII.30
spectrum of a self-adjoint element % VIII.32
Gelfand-Neimark theorem % VIII.33
on one-to-one $*$-homomorphisms % * VIII.35
spectrum with respect to a C^*-subalgebra % VIII.36
Fuglede theorem % * VIII.37
continuous functional calculus in unital C^*-algebras % + VIII.38
%
%%% Chapter IX
%
characterization of unitary operators % IX.1
on subsets of the spectrum % IX.2
properties of the numerical radius % + IX.4 (incl. IX.3)
structure of normal operators % + IX.5
characterization of orthogonal projections % IX.6
on spectrum and numerical range of a self-adjoint operator % IX.7
polar decomposition % IX.8
Hilbert Schmidt theorem % + IX.9
Schmidt representation of compact operators % IX.11
Lax-Milgram lemma % * IX.12
construction and properties of the measurable calculus % + IX.15