

Functional Analysis Seminar, Leiden 2015

Topics of first session, 20 Feb. 2015

- Definitions: partial order, partially ordered vector space, Riesz space (= vector lattice) dJvR §1 p. 5-7.
- Positive cone, generating, directed LZ p. 59.
- Lexicographical order on $\mathbb{R}^2$ ($\mathbb{R}^n$) dJvR 1.0 p. 6.
- Archimedean dJvR Def 4.1 p. 23.
- Dedekind completeness:
 - def. dJvR Def 4.2 p. 23
 - Dedekind complete $\Rightarrow$ Archimedean dJvR Thm 4.4 p. 25
 - Dedekind completion LZ 32.1 p. 185 and LZ 32.5 p. 191.
- Lattice formulas dJvR Thm 1.9 p. 8.
- Riesz subspace, ideal, band:
 - def. dJvR Def. 2.1 p. 11
 - quotient over ideal dJvR p. 17-19
 - A band $\iff A = A^{dd}$ dJvR Thm 4.3 p. 23
- Projection bands:
 - def. dJvR p. 29
 - X Dedekind complete $\Rightarrow$ every band is projection band dJvR Thm 4.5 p. 29

- Positive, order bounded and regular functionals dJvR §5 p. 37-4.
- Thm X Riesz space $\Rightarrow$ order dual is Ded. complete Riesz space dJvR Thm 1.7 p. 1 including Riesz-Kantorovich formulas and Riesz decomposition lemma
- Monotone norm, Riesz norm, Banach lattice dJvR §9 p. 61-63

Theorem: If X Banach lattice then $X'' = X'$

dJvR Thm 10.1 p. 63

dJvR: de Jonge and van Rooij, Introduction to Riesz spaces.

LZ: Luxemburg and Zaanen, Riesz spaces I.