

Functional Analysis

Typed by: tw1320@ic.ac.uk

October 22, 2022

1 Preliminaries

1.1 Norms and Metrics

Definition 1.1. (Metric)

(translation invariant)

Definition 1.2. (Normed Linear Spaces)

Definition 1.3. (Metric Linear Spaces)

1.2 Common Spaces

1.3 Inequalities

Proposition 1.4. (Young)

Corollary 1.5. *(i)(Hölder) (ii)(Minkowski)*

Proposition 1.6. (Jensen)

Proposition 1.7. (Equivalent forms of Jensen)

- 2 Completeness and Separability
- 3 Hilbert Spaces
- 4 Finite Dimensional Spaces
- 5 Linear Operators
- 6 Dual Spaces
- 7 The Hahn Banach Theorems
- 8 The Uniform Boundedness Theorem
 - 8.1 Baire's Category Theorem
- 9 The Open Mapping Theorem
- 10 The Closed Graph Theorem
- 11 Compact Operators