

MM513 Probability Theory II

Ugeseddel 5

In the lectures in week 20 we have covered the following material: A proof of Theorem 4.5 in the notes, some additional results on integration with respect to Borel measures to be used in the martingale proof of The Strong Law of Large numbers and that proof. A representation theorem of continuous linear functionals on a Hilbert space, and a proof of The Radon–Nikodym Theorem for finite measures. This corresponds to the notes, pages 20, 23–27. Notes on Hilbert spaces 25–26, Notes on The Theorem of Radon Nikodym 1–5.

For The Strong Law of Large Numbers you can also JP pages 227–228. Please note however, that the argument for their formula (27.2) by symmetry and their reference to their exercise 17 is covered by our preparations above.

In the lectures in week 21 we shall cover the rest of the notes on the Radon–Nikodym Theorem, prove Kolmogorovs $0 - -1$ law, and a martingale inequality by Doob.

Exercise for week 21

- Remaining problems from week 20.
- The obligatory problems from 2012 (see the home page): 2. This problem is quite long, but please try to do it in all details.

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