

Topics for the Test (21.03.07 or 18.04.07)

1. PROBABILITY SPACES

- (1) **σ -algebra:** definition 1.1.1 + 1.1.9, example 1.1.2, propositions 1.1.*.
- (2) **probability measure:** definitions 1.2.1, 1.2.7, 1.2.9, 1.2.12, 1.2.13, 1.2.19 and 1.2.22
proposition 1.2.6, 1.2.17. and 1.2.23
- (3) **examples of distributions:** how to compute $\mathbb{E}f$ and $\mathbb{E}(f - \mathbb{E}f)^2$ if f has one of the distributions 1.3.1, 1.3.2, 1.3.3, 1.3.4

2. RANDOM VARIABLES

- (1) **measurable step-function:** definition 2.1.1 + examples,
- (2) **random variables+measurability:** definition 2.1.2, proposition 2.1.3, 2.1.4,2.1.5 and 2.2.6, lemma 2.2.3, example 2.2.4, proposition 2.2.5, definitions 2.2.7 and 2.2.8, proposition 2.2.10.
- (3) **independence:** definition 2.3.2, proposition 2.3.4 + 2.3.5.

3. INTEGRATION

- (1) **definition of the expectation:** definition 3.1.1, 3.1.4 and 3.1.5, example 3.1.7
- (2) **properties of the expectation:** proposition 3.2.1, 3.2.3, 3.2.4, 3.2.6, 3.2.7 and 3.2.8
- (3) **connections to the Riemann-integral:** proposition 3.3.1+3.3.2
- (4) **change of variables:** proposition 3.4.1

- (7) **inequalities** propositions 3.6.1, 3.6.3, 3.6.5, 3.6.8
- (8) **Radon-Nikodym** definition 3.7.1, theorem 3.7.3