Weekly notice #12

The lectures in week 16: We covered product measures and Tonelli's Theorem and finished by actually computing an integral (of e^{-x^2}, over $\mathbb{R}$).

The lectures in week 18: Some discussion of Fubini's Theorem and applications, but proofs will be left to yourselves. After that we embark on §7: L_p spaces, where we ought to reach at least Hölders Inequality.

Notice: Exam Exercises may be found (in Danish) via the course home page. In a few days, they will appear here also.

Homework - to be handed in to the TA in week 19: 3MI-Exams: January '02 Exercise 6 and May '01 Exercise 5.

The problem sessions in week 19: W12.1, 6.22, 6.25, 6.26; 3MI-Exam June 1999: Exercises 4, 5*; 7.1*

Problem W12.1. Let ε_2 be the Dirac measure on $\mathbb{R}$, given on any subset A of $\mathbb{R}$ by: $\varepsilon_2(A) = 1$ if $2 \in A$, and 0 otherwise. Let $G \subseteq \mathbb{R}^2$ be given by

$$G = \{(x, y) \in \mathbb{R}^2 \mid x \geq 0, y \geq 0, x + y \leq 4\}.$$

Determine $(m \otimes \varepsilon_2)(G)$.
Let $f : \mathbb{R}^2 \mapsto \mathbb{C}$ be given by $f(x, y) = (x^2 + y^2 + 1)^{-1}$. Compute

$$\int_{\mathbb{R}^2} f \, d(m \otimes \varepsilon_2).$$

Set $\mu = m \otimes \varepsilon_2 + \varepsilon_2 \otimes m$. Compute

$$\int_{\mathbb{R}^2} f \, d\mu.$$