HELSINKI UNIVERSITY OF TECHNOLOGY
Institute of Mathematics
Mat-1.500 Martingale Theory, Fall 2002

Exercise II
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1. Let Y be a random variable. Define $\Pi(Y) = (\{m : Y(m) \leq x\}, x \in \mathbb{R})$. Show that $\sigma(Y) = \sigma(\Pi(Y))$.

2. Show that the random variables $X_n := g_n(Y_n)$ are independent (see[1] upper half of p. 43 for explanation what X_n, Y_n are).

3. Do Exercise E4.4, p. 226.

4. Do the exercise on p. 46 (middle of page).

[1] Nota bene: All citations here refer to the book *Probability with Martingales* by D. Williams (Cambridge University Press 1991).