Christian-Albrechts-Universität zu Kiel **Summer term 2016**
Mathematisches Seminar
Prof. Dr. M. Vetter, O. Martin

In-tutorial exercise sheet 8

supporting the lecture Mathematical Finance and Stochastic Integration

(Discussion in the tutorial on June 16th 2016, 2:15 p.m.)

Exercise P.16.

Find a class of processes which is not stable with respect to stopping.

Exercise P.17.

Find a process which is càdlàg but not locally bounded.

Hint: It is sufficient to consider a process which consists of a single jump at a deterministic time.

Exercise P.18.

Let $(X_t)_{t\geq 0}$ be a local martingale with $X_0 = 0$ and ξ $\mathcal{F}_0$-measurable (ξ does not have to be in L^1). Prove that $(\xi X_t)_{t\geq 0}$ is a local martingale.

Hint: Consider the stopping times

$$\sigma_n = \begin{cases} \infty, & |\xi| \leq n \\ 0, & |\xi| > n \end{cases}.$$