Math Finance (cont. time), SS20 , Sheet 1

1. Recall the concept of conditional expectation and its most important properties.
2. Show that if H is a bounded trading strategy and X is a martingale, then the process $((H \cdot X)_t)_{t=0}^T$ is a martingale as well.
3. Show that X is a martingale iff $\mathbb{E}(H \cdot X)_T = 0$ for all bounded trading strategies H.
4. Show that if X is a martingale, then X satisfies NA. More generally, if there exists an equivalent martingale measure for X, then X satisfies NA.
5. Construct a model which admits an arbitrage opportunity and a model which satisfies NA.