

Mathematical Finance 2

Exercise sheet 2

1. Solve Exercise 2.2 of Shreve's book and compute additionally $\mathbb{E}[S_1|X = 1]$.
2. Let X, Y be independent, both with uniform distribution on $[0, 1]$. Compute the conditional expectation of $Z = \min(X, Y)$ and of $W = (X + Y)^2$ given X .
3. Let (W_t) be a standard Brownian motion.
 - a) Show that $-W_t$ is a standard Brownian motion, too.
 - b) Let $c > 0$. How do we have to choose the constant u to make $X_t := uW_{ct}$ a standard Brownian motion?
4. If Z is a normal $N(0, 1)$ random variable, then the process X defined by

$$X(t) = \sqrt{t}Z$$

is continuous and is marginally distributed $N(0, t)$. Is X a Brownian motion?

Website: http://www.mat.univie.ac.at/~finance.hp/exercisesSS13_MF.html