Mathematical Finance 2
Exercise sheet 11

1. Solve Exercise 5.8 in Shreve's book.

Hint: Consider the process

$$\tilde{M}(t) = V(t)D(t), \text{ where } D(t) = \exp\left(-\int_0^t R(u)du\right)$$

is as usual the discount factor.

Remark that there is a typo in the book: indeed where it says

$$\tilde{M}(t) = \tilde{M}(0) + \int_0^t \tilde{\Gamma}(u)d\tilde{B}(u)$$

you should substitute $d\tilde{B}$ with $d\tilde{W}$.

2. Solve 5.11 in Shreve's book.

Hint: find X_0 and Δ such that

$$D_t X_t \text{ and } \tilde{M}_t - \int_0^t C_u D_u du$$

have the same value at time $t = 0$ and have the same "differential" at every time...

Remark that the process $\tilde{\Gamma}$ of Corollary 5.3.2 will appear in your expressions.

3. Solve Exercise 5.12 in Shreve's book.