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Financial Mathematics 1 - Spring term 2015

Exercise sheet no.6 (16.04.2015)

Exercise 1: Show the identity

$$1 - 2p = \frac{2 - e^{\sigma \frac{T}{N}} - e^{-\sigma \frac{T}{N}}}{e^{\sigma \frac{T}{N}} - e^{-\sigma \frac{T}{N}}}$$

and show that

$$\lim_{N \to \infty} N E^*[X_j^N] = -\frac{\sigma T}{2}$$

as claimed on page 29 of the lecture. Moreover show

$$\lim_{N \to \infty} \text{var} \left(\sum_{j=1}^{N} \log \left(\frac{T_j}{1 + r_N} \right) \right) = \sigma^2 T$$

where the variance of a square integrable r.v. X is defined by $\text{var}(X) := E[(X - E[X])^2]$.

Please drop the solutions into the homework box of the lecture until 30.04.2015, 6 pm