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Financial Mathematics 2 - Fall term 2015

Exercise sheet no.10 (26.11.2015)

Exercise 1:

(i) Suppose, with the notations of Section 7.4, that U_1 takes values in $\{a, b\}$, with $p = P(U_1 = a) = 1 - P(U_1 = b)$. Write the price formula for $F(t, x)$ in 7.4.3 as a double series where each term is calculated from the Black-Scholes formula.
(Hint: use Exercise 2 from Assignment no.9.)

(ii) Suppose that U_1 has the same law as $e^g - 1$, where g is normally distributed with mean m and variance σ^2. Write the price formula for $F(t, x)$ in 7.4.3 as a series of terms calculated from the Black-Scholes formula (for some interest rates and volatilities to be given).

Exercise 2: Let $(\Omega, \mathcal{A}, P)$ be a probability space and $\mathcal{B}$ a sub-σ-algebra of $\mathcal{A}$. Let $A \in \mathcal{A}$ and $X = \mathbb{E}[1_A \,|\, \mathcal{B}]$. Prove that $P(A \cap \{X > 0\}) = P(A)$, so that, on the set A, $X > 0$ almost surely.

Please drop the solutions into the homework box of the lecture until 3.12.2015, 6 pm