MF795: Assignment №5

Due on Tuesday, November 24, 2020

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Do the following

EXERCISE: Let X and X' be any two continuous semimartingales with canonical decomposition, respectively, $X = M + A$ and $X' = M' + A'$. Show that $X'e^X$ is a continuous semimartingale and find its canonical decomposition into the sum of a local martingale and a process of finite variation. Do the same in the special case where X and X' are Itô processes of the form $X = \sigma \cdot W + b \cdot \iota$ and $X' = \sigma' \cdot W + b' \cdot \iota$. Finally consider the case where σ, σ', b, and b' are real constants (parameters).

In addition, do the following exercises from SMAP:

Exercise (11.37), Exercise (11.38), Exercise (11.39), Exercise (11.42), Exercise (11.43),

Exercise (11.44), Exercise (11.46), Exercise (11.49), Exercise (11.52), Exercise (11.57),

Exercise (11.59), Exercise (11.61).

In Exercise (11.37) consider separately the special case where $A \equiv \iota$ and $Z \equiv W$ is a Brownian motion. In Exercise (11.39) consider separately the special case where $Y \equiv W$ is a Brownian motion and $Z \equiv \iota$.

PLEASE NOTE: Your assignment will not be accepted without a completed cover sheet. While typing the assignments is not required, it would be very beneficial for you if you do typeset your homework by using any of the widely available programs for technical typesetting: Google Docs, MS Word, TEX or LaTEX (the industry standard). *Irrespective of how your document is created, your submission will not be accepted unless it is in PDF format!*

TEXX