

Stochastic Calculus in Finance
Practice problems

A. Do exercises 6.1 and 6.2 on page 93 of the text.

B. (a) Verify, using Ito's lemma, that

$$M_t = e^{\alpha B_t - \frac{\alpha^2 t}{2}}$$

is a martingale.

(b) For a given α , what choice of β makes

$$N_t = e^{\beta t} \cos(\alpha B_t)$$

a martingale? Use this to calculate $E[\cos(4Z)]$, where $Z \sim N(0, 1)$.

C. Do problem 8.4(b) from p. 135 of Steele.