# Financial Mathematics

## Basics of processes

3600-1. Let $W_t$ be a Brownian motion.

a. Compute $\mathsf{E}[W_5^7 W_4^9]$.

b. Compute $\mathsf{E}\left[\int_0^6 W_t^4\,dt + (e^{W_t} - e^2)_+^2\,dW_t\right]$.

That is, compute the expectation of the sum of $\int_0^6 W_t^4\,dt$ and $\int_0^6 (e^{W_t} - e^2)_+^2\,dW_t$.

c. Compute

$$\mathsf{E}\left[\int_0^5 W_t^8\,dt + \sin^2(4W_t - 2)\,dW_t\right].$$