In-tutorial exercise sheet 4

supporting the lecture on Malliavin Calculus

(Discussion in the exercise group on June 14, 2017, 2:15 p.m.)

Exercise 7.

Let $F : C[0,1] \to \mathbb{R}$ with

$$F(\omega) = \int_0^1 \omega(s)ds.$$

Prove that F is Fréchet differentiable and compute its derivative operator DF_ω.

Exercise 8.

Let X, Y and Z be normed vector spaces and let $g : X \to Y$ and $f : Y \to Z$ be Fréchet differentiable. Show that $f \circ g : X \to Z$ is Fréchet differentiable with derivative operator

$$D(f \circ g)_\omega = Df_{g(\omega)} \circ Dg_\omega.$$