

THE CHINESE UNIVERSITY OF HONG KONG
Department of Mathematics
MATH4010 Functional Analysis 2021-22 Term 1
Homework 1
Deadline: 2021-09-20 Monday

Notice:

- All the assignments must be submitted before the deadline.
- Each assignment should include your name and student ID number.

1. Show that

$$\|x\| = \sum_{k=0}^n \sup_{t \in [0,1]} |x^{(k)}(t)| \tag{1}$$

is a norm on $C^n[0, 1]$.

2. Let K be a compact topological space. Prove that the spaces $C(K)$ with sup-norm and $C^n[0, 1]$ with the norm defined in (1) are Banach spaces.

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