

Assignment #8

Due Friday, 17 April 2020, at 5pm. Send electronically.

Please read Chapter 13 on Banach algebras and Chapter 14 on spectral theory. This Assignment is short, and focussed on basic aspects of Banach algebras, power series, analytic functions, and the spectrum.

One exercise below is identified with your initials. Please \LaTeX this problem and send both the .tex and .pdf to me at `elbueler@alaska.edu` by the due date.

DO THE FOLLOWING EXERCISES from the textbook (Muscato, *Functional Analysis*, 2014):

- #10 in Exercises 13.19, page 294. Assume $T \in \mathcal{B}$ where \mathcal{B} is any Banach algebra, the power series is $\sum_{n=0}^{\infty} a_n T^n$, and $R = 1/(\limsup_n |a_n|^{1/n})$.
- #11 in Exercises 13.19, page 294.
- #2 in Exercises 13.25, page 298. In the Banach algebra ℓ^∞ , multiplication is pointwise and the norm is $\|\cdot\|_\infty$. The same applies to the Banach algebra $C[0, 1]$.
- #6 in Exercises 13.25, page 298. Here $X = C[a, b]$ is a Banach space, the Banach algebra is $B(X)$, and $T \in B(X)$.
- #2 in Exercises 14.7, page 312. \leftarrow **WV** In this Banach algebra, multiplication is pointwise and the norm is $\|\cdot\|_\infty$.
- #3 in Exercises 14.7, page 312. \leftarrow **OS**
- #5 in Exercises 14.7, page 312. \leftarrow **DD** You may assume L, R act on ℓ^1 , but it does not matter much.