



POSITIVE POLYNOMIALS AND MOMENT PROBLEMS—SS 2019

Recap Sheet 6

*This recap sheet aims to self-assess your progress and to recap some of the definitions and concepts introduced in the previous lectures. You do **not** need to hand in solutions, but please try to answer as many questions as you can since this is a very good training in preparation of your final exam. If you should have any problem, please do not hesitate to attend Maria's office hours on Wednesdays 2-3 pm in room F408.*

- 1) Recall Carleman's condition and give sufficient conditions guaranteeing that it holds.
- 2) Does the uniqueness of the measure given by the spectral theorem for unbounded operators imply the determinacy of the representing measure in Nussbaum's theorem?
- 3) Recall the definition of K -determinate measure for $K \subseteq \mathbb{R}^n$. What is the relation between Carleman's condition and \mathbb{R}^n -determinacy?
- 4) Provide an example of a measure which is \mathbb{R} -determinate and an example of measure which is not \mathbb{R} -determinate.
- 5) How does the Carleman condition play a crucial role in localizing the support of the representing measure in the study of the n -dimensional K -moment problem?
- 6) Recall the definition of log-convex sequence. Can you justify the terminology?
- 7) Assume that $s := (s_n)_{n \in \mathbb{N}_0}$ is a moment sequence that fulfils Carleman's condition. Which other sequences can you construct out of s such that they also fulfill Carleman's condition?
- 8) Recall the definition of quasi-analytic class of functions and characterize this notion.
- 9) What is the relation between quasi-analytic classes and the Carleman condition?
- 10) State Petersen's theorem and recall its role in the proof of the multivariate version of Carleman's theorem.