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TOPOLOGICAL ALGEBRAS–SS 2018

Recap Sheet 4

*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 Thursdays 2-3 pm in room F408.*

1) Recall the definition of Fréchet algebra resp. Fréchet lmc algebra and give examples of both notions.

2) Recall the definition of Cauchy filter and show that the filter associated to a Cauchy sequence is in fact a Cauchy filter.

3) Recall the definition of completeness for a TVS and sketch a proof for the statement that every complete TVS is sequentially complete.

4) Do you know any sufficient condition for the notions of completeness and sequentially completeness to coincide in a TVS? Give an example where those notions are not equivalent.

5) Show that every A-convex Fréchet algebra is a Fréchet lmc algebra.

6) Which classes of TA do you know that are in fact TA with continuous multiplication?

7) Does metrizability always imply local boundedness? Justify your answer!

8) What is the connection between lb TVS and quasi-norms (resp. α–norms)?

9) Which generalization of the notion of norm do you know? Provide an example for each of them.

10) What is the relation between local boundedness and local convexity?