DEPARTMENTAL COLLOQUIUM

Scalar, vector and multi-valued integration

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Abstract: *We start by solving an exercise about measurability that requires knowledge of a basic course of measure theory. From here we review the views of Frchet about Lebesgue integral and we recall the notions of Bochner and Pettis integrability. The second part of the lecture touches topics on research still open: we show how a modification of the ideas in the starting exercise is used to provide a characterization of Birkhoff integrability that nicely lies in between Bochner and Pettis integrability: Birkhoff integrability can be defined via limits of Riemann type sums. Another modification in the exercise is used to prove an extension of the classical Kuratowski and Ryll-Nardzewski's selection theorem about the existence of measurable selectors for multi-functions. The latter is applied to the theory of integration of multi-functions.*