

The title would be 'Radon-Nikodym derivatives and martingales using category theory'.

Abstract: We give a categorical proof of the Radon-Nikodym theorem in measure theory. We start from the easier Radon-Nikodym theorem on finite probability spaces and then can extend the result to general probability spaces. From this the concept of conditional expectation arises naturally. We then repeat this with everything enriched over complete metric spaces. Using this we (categorically) prove a version of the martingale convergence theorem.