Infinite-Dimensional Calculus I: The Derivative

Abstract:
Calculus in normed vector spaces is the basis for several areas of mathematics and physics, but it is not a topic that is often covered with very much care or detail. This talk’s focus is the theory of differentiation in normed vector spaces, more specifically the Gateaux and Fréchet derivatives. Towards the end, we shall cover an infinite-dimensional Taylor’s Theorem, and we shall likely get to discuss some applications. Plus, there will be plenty of examples throughout! This talk is Part I of a (likely) three- or four-part series, with future topics including integration and complex analysis.