Homotopy and the Kestelman–Borwein–Ditor Theorem

To David Borwein on his 85th birthday

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Abstract. The Kestelman–Borwein–Ditor Theorem, on embedding a null sequence by translation in (measure/category) “large” sets has two generalizations. Miller replaces the translated sequence by a “sequence homotopic to the identity”. The authors, in a previous paper, replace points by functions: a uniform functional null sequence replaces the null sequence, and translation receives a functional form. We give a unified approach to results of this kind. In particular, we show that (i) Miller’s homotopy version follows from the functional version, and (ii) the pointwise instance of the functional version follows from Miller’s homotopy version.

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