

The set of Pringsheim-singular functions: Linear structure

Luis Bernal-González

Universidad de Sevilla.

Although the set of nowhere analytic functions on $[0, 1]$ is clearly not a linear space, we show that the family of such functions in the space $C^\infty[0, 1]$ contains, except for zero, a dense linear manifold. More is true: the class of C^∞ -functions having Pringsheim singularities everywhere is dense-lineable. Moreover, in spite of the fact that the space $D[0, 1]$ of differentiable functions on $[0, 1]$ contains no closed infinite dimensional manifold in $C[0, 1]$ [Gurariy, 1966] (i.e. $D[0, 1]$ is not spaceable) we obtain the spaceability of $C^\infty(0, 1)$ in $C(0, 1)$.