

Novi pristup teoriji frakcionalne derivacije

New approach to the fractional derivatives

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Recently, Trenevski (see: IJMMS, 2003, pp. 315-325) introduced a new approach to the fractional derivatives of the analytical functions using the Taylor series of the functions. The method of calculating the fractional derivatives very often requires a summation of divergent series, and thus in this note, we first introduce a method of such summation of series via analytical continuation of functions. This method will be illustrated by examples for functions of exponential type. In AJMAA (2005), Vol. 2 we introduced an alternative definition of the fractional derivatives and also a characteristic class of so called ideal functions, which admit arbitrary fractional derivatives (also integrals). Further some ideal functions are found, which lead to representations of the Bernoulli and Euler numbers B_k and E_k for any real number k , via fractional derivatives of some functions at $x=0$.