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IL 60614. *On generalized Riemann derivatives for functions on  $\mathbb{R}^n$  and on  $\mathbb{C}$ .* Preliminary report.

An  $n$ th generalized Riemann derivative  $D_{\{A_i, b_i\}} f(x)$  is given by specifying  $2m$  real constants  $\{A_i, b_i\}$ ,  $i = 1, 2, \dots, m$ , such that for any real valued function  $f$  having  $n$  derivatives at any real number  $x$ , there holds the identity  $D_{\{A_i, b_i\}} f(x) := \lim_{h \rightarrow 0} h^{-n} \sum_{i=1}^m A_i f(x + b_i h) = f^{(n)}(x)$ . These derivatives are fairly well understood. Generalized Riemann derivatives can further be defined for real valued functions on higher dimensional Euclidean spaces and also for functions on the complex numbers. I will discuss some results we have obtained in these settings as well as some related open questions. (Received August 10, 2015)