1086-49-592 **Ivan Ginchev Ivanov*** (iivanov1@iit.edu), Illinois Institute of Technology, 10 West 32-nd Street, E1 Building, Room 116a, Chicago, IL IL 60616, and **Denitza Gintcheva** (gintcheva@math.rochester.edu), UR Mathematics, 915 Hylan Building, RC Box 270138, Rochester, NY NY 14627. *Characterization and recognition of d.c. functions.*

A function $f : \Omega \to \mathbb{R}$, where Ω is a convex subset of the linear space X, is said to be d.c. (difference of convex) if $f = g - h$ with $g, h : \Omega \to \mathbb{R}$ convex functions. While d.c. functions find various applications, especially in optimization, the problem to characterize them is not trivial. The guideline characterization in this paper is relatively simple, but useful in various applications. For example, we use it to prove that piecewise affine functions in an arbitrary linear space are d.c.. Additionally, we give new proofs to the known results that $C^{1,1}$ functions and lower-C^2 functions are d.c.. The main goal remains to generalize to higher dimensions a known characterization of d.c. functions in one dimension: A function $f : \Omega \to \mathbb{R}, \Omega \subset \mathbb{R}$ open interval, is d.c. if and only if on each compact interval in Ω the function f is absolutely continuous and has a derivative of bounded variation. We obtain a new necessary condition in this direction. We prove an analogous sufficient condition under stronger hypotheses. The proof is based again on the guideline characterization. (Received September 07, 2012)