Mathematical
Inequalities
& Applications
Volume 11, Number 3 (2008), 571–583

ON SOME ABSTRACT CONVEXITY NOTIONS IN REAL LINEAR SPACES

RADU IOAN BOŢ, ERNÖ ROBERT CSETNEK AND GERT WANKA

Abstract. We introduce some abstract convexity notions in a real linear space and investigate which of the results from the convex analysis in topological vector spaces still work in a linear space. The differences between these abstract convexity notions and those established in spaces endowed with a topology are underlined by some examples.

Mathematics subject classification (2000): 15A03, 52A01, 52A41.
Key words and phrases: abstract convexity, c-convex hull, c-convexity.

REFERENCES

[1] DOLECKI, S., KURCYUSZ, S. (1978): *On ϕ-convexity in extremal problems*, SIAM Journal on Control and Optimization 16, 277-300.
[2] EKELAND, I., TEMAM, R. (1976): *Convex analysis and variational problems*, North-Holland Publishing Company, Amsterdam.
[3] ELSTER, K.H., NEHSE, R., (1974): *Zum Dualitätssatz von Fenchel*, Mathematische Operationsforschung und Statistik 5, Vol. 4/5, 269-280.
[4] ERNST, E., THÉRA, M., VOLLE, M. (2006): *Self-equilibrating sets and functions in dual vector spaces: two boundedness criteria*, Rapport de Recherche N° 1, Université de Limoges.
[5] HOLMES, R.B. (1975): *Geometric functional analysis*, Springer-Verlag, Berlin.
[6] KUTATELADZE, S.S., RUBINOV, A.M. (1972): *Minkowski duality and its applications*, Russian Mathematical Surveys 27(3), 137-1972.
[7] MARTINEZ-LEGAZ, J.E., SINGER, I. (1998): *On ϕ-convexity of convex functions*, Linear Algebra and Its Applications, 278, 163-181.
[8] PEDERSEN, G.K. (1989): *Analysis now*, Graduate Texts in Mathematics, 118, Springer-Verlag, New York.
[9] PINI, R., SINGH, C. (1997): *A survey of recent [1985-1995] advances in generalized convexity with applications to duality theory and optimal conditions*, Optimization 39, 311-360.
[10] ROCKAFELLAR, R.T. (1970): *Convex analysis*, Princeton University Press, Princeton.
[11] ROLEWICZ, S. (2001): *Open problems in Φ-convexity*. Unsolved Problems on Mathematics for the 21st Century, 101-108, IOS, Amsterdam.
[12] RUBINOV, A.M. (2000): *Abstract convexity and global optimization*, Nonconvex Optimization and Its Applications 44, Kluwer Academic Publishers.
[13] SINGER, I. (1997): *Abstract convex analysis*, John Wiley, New York.
[14] SOLTAN, V.P. (1984): *Introduction to axiomatic theory of convexity* (in Russian), Stiinca, Kishiniev.
[15] ZĂLINESCU, C. (2002): *Convex analysis in general vector spaces*, World Scientific, Singapore.

© ELEMENT, Zagreb
Paper MIA-11-47