

ON m -CONVEXITY OF SET-VALUED FUNCTIONS

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ABSTRACT. We introduce the notion of an m -convex set-valued function and study some properties of this class of functions. Several characterizations are given as well as certain algebraic properties and examples. Finally, an inclusion of Jensen type is presented jointly with a sandwich type theorem.

REFERENCES

1. S. S. Dragomir, *On some new inequalities of Hermite-Hadamard type for m -convex functions*, Tamkang J. Math. **33** (2002), no. 1, 55–65.
2. A. Geletu, *Introduction to topological spaces and set-valued maps (Lecture notes)*, Institute of Mathematics. Department of Operations Research & Stochastics Ilmenau University of Technology. August 25, 2006.
3. T. Lara, N. Merentes, Z. Páles, R. Quintero, and E. Rosales, *On m -convexity on real linear spaces*, UPI J. Math. Biostat. **1** (2018), no. 2, 1–16.
4. J. Matkowski and K. Nikodem, *Convex set-valued functions on $(0, +\infty)$ and their conjugate*, Rocznik Nauk.-Dydakt. Prace Mat. No. 15 (1998), 103–107.
5. K. Nikodem, *On concave and midpoint concave set-valued functions*, Glasnik Mat. Ser. III **22(42)** (1987), no. 1, 69–76.
6. J. Roojin, A. Alikhani and M. Moslehian, *Operator m -convex functions*, Georgian Math. J. 2018, 25(1), 93–107.
7. E. Sadowska, *A sandwich with convexity for set-valued functions*, Math. Pannon. **7** (1996), no. 1, 163–169.

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8. G. Toader, *Some generalizations of the convexity*, Proc. Colloq. Approx. Optim. Cluj-Napoca (Romania) (1984), 329–338.
9. G. Toader, *On a generalization of the convexity*, Mathematica (Cluj) **30(53)** (1988), no. 1, 83–87.

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