

THE HORNICH-HLAWKA INEQUALITY AND BERNSTEIN FUNCTIONS

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Abstract. The Hornich-Hlawka inequality for three real numbers is extended from the identity function to all Bernstein functions on the half-line. For vectors in a Euclidean space it is shown to hold for the square-root function.

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REFERENCES

- [1] C. BERG, J. P. R. CHRISTENSEN AND P. RESSEL, *Harmonic Analysis on Semigroups*, Springer-Verlag, New York, 1984.
- [2] E. HLAWKA, *Ungleichungen*, Manz-Verlag, Wien, 1990.
- [3] H. HORNICH, *Eine Ungleichung für Vektorlängen*, Math. Zeitschrift, **48** (1942), 268–274.
- [4] L. M. KELLY, D. M. SMILEY AND M. F. SMILEY, *Two dimensional spaces are quadrilateral spaces*, Amer. Math. Monthly, **72** (1965), 753–754.
- [5] D. S. MITRINOVIC, *Analytic Inequalities*, Springer-Verlag, New York, 1965.
- [6] J. E. PECARIĆ, F. PROSCHAN AND Y. L. TONG, *Convex Functions, Partial Orderings, and Statistical Applications*, Acad. Press, Boston, 1992.
- [7] P. RESSEL, *Functions operating on multivariate distribution and survival functions – With applications to classical mean-values and to copulas*, J. Multivar. Analysis, **105** (2012), 55–67.
- [8] R. SCHILLING, R. SONG AND Z. VONDRAČEK, *Bernstein Functions*, de Gruyter-Verlag, Berlin, 2010.
- [9] D. M. SMILEY AND M. F. SMILEY, *The polygonal inequalities*, Amer. Math. Monthly, **71** (1964), 755–760.
- [10] J. H. WELLS AND L. R. WILLIAMS, *Embeddings and Extensions in Analysis*, Springer-Verlag, New York, 1975.