REVERSE FORM OF THE MINKOWSKI
INEQUALITIES WITH APPLICATIONS

JUANJUAN PAN, SHIGUO YANG AND WEN WANG*

Abstract. In this paper, we obtain the reverse of Minkowski inequality for matrices, and from this we give reverse forms of the Oppenheim inequality for n-simplices and the Neuberg-Pedoe inequality for triangles.

Mathematics subject classification (2020): 15A60, 47A30, 52A40.
Keywords and phrases: Inequality, matrix, simplex, triangle.

REFERENCES

[1] E. V. HAYNESWORTH, *Bounds for determinants with positive diagonals*, Trans. Amer. Math. Soc., 96 (1960), 395–413.

[2] E. V. HAYNESWORTH, *Note on bounds for certain determinats*, Duke. Math. J., 24 (1957), 313–320.

[3] Y. D. ZHANG, *Theory of Linear Algebra*, Shanghai: Shanghai Educational Press, 1980 (in Chinese).

[4] H. BERGSTROM, *A triangle inequality for matrices*, Den Elfte Skandiaviski Matematiker-kongress, Trondheim, 1949.

[5] K. FAN, *Some inequalities concerning positive-definite Hermitian matrices*, Proc. Cambrige Phil. Soc., 51 (1958), 414–421.

[6] J. YUAN, G. S. LENG, *A generalization of the matrix form of the Brunn-Minkowski inequality*, J. Aust. Math., 83 (2007), 125–134.

[7] C. BORELL, *Capacitary inequality of the Brunn-Minkowski inequality type*, Math. Ann., 263 (1993), 179–184.

[8] R. OSSERMAN, *The Brunn-Minkowski inequality for multiplictities*, Invent. Math., 125 (1996), 405–411.

[9] R. J. GARDNER, *The Brunn-Minkowski inequality*, Bull. Amer. Math. Soc., 39 (2002), 355–405.

[10] M. FIEDLER, T. MARKHAM, *Some results on the Bergstrom and Minkowski inequality*, Linear Algebra Appl., 232 (1996), 199–211.

[11] R. J. GARDNER, P. GRONCHI, *A Brunn-Minkowski inequality for the integer lattice*, Trans. Amer. Math. Soc., 353 (2001), 3995–4024.

[12] J. C. BOURIN, M. UCHIYAMA, *Amatrix subadditivity inequality for $f(A+B)$ and $f(A)+f(B)$*, Linear Algebra Appl., 423 (2007), 512–518.

[13] R. SCHNEIDER, *Convex Bodies: The Brunn-Minkowski inequality theory*, Cambridge: Cambridge University Press, 1993.

[14] A. OPPEMHEIM, *Advanced problem 5092*, Amer. Math. Monthly, 70 (1963), 444.

[15] D. S. MITRINOVIC, J. E. PECARIC, *About the Neuberg-Pedoe and the Oppenheim inequalities*, J. Math. Anal. Appl., 129 (1988), 196–210.

[16] R. ALEXANDER, *The geometry of metric and linear space*, Berlin: Springer-Verlay, 1975.

[17] L. YANG, J. Z. ZHANG, *On Alexander's conjecture*, Chinese Sci. Bull., 27 (1982), 1–3.

[18] D. PEDOE, *An inequality for two triangles*, Proc. Cambridge philos, Soc., 38 (1943), 397–398.

[19] F. ZHANG, *Matrix theory: basic results and techniques*, Springer Science Business Media, 2011.

© ELEM, Zagreb
Paper JMI-16-70

Journal of Mathematical Inequalities
www.ele-math.com
jmi@ele-math.com