Journal of Mathematical Inequalities
Volume 8, Number 1 (2014), 91–106
doi:10.7153/jmi-08-05

A GEOMETRIC INEQUALITY WITH ONE PARAMETER FOR A POINT IN THE PLANE OF A TRIANGLE

JIAN LIU

Abstract. With the help of mathematical software Maple for calculations, we establish a new geometric inequality with one parameter on a given interval involving an arbitrary point in the plane of a triangle. Two related interesting conjectures checked by the computer are put forward.

Mathematics subject classification (2010): 51M16, 51N20.
Keywords and phrases: Triangle, point, Erdös-Mordell inequality, identity.

REFERENCES

[1] A. AVEZ, *A short proof of the Erdös and Mordell theorem*, Amer. Math. Monthly., **100**, (1993), 60–62.
[2] C. ALSINA AND R. B. NELSEN, *A visual proof of the Erdös-Mordell inequality*, Forum Geom., **7**, (2007), 99–102.
[3] L. BANKOFF, *An elementary proof of the Erdös-Mordell theorem*, Amer. Math. Monthly., **65**, (1958), 521.
[4] M. BOMBARDELLI AND S. H. WU, *Reverse Inequalities of Erdös-Mordell type*, Math. Inequal. Appl., **12**, 2 (2009), 403–411.
[5] O. BOTTEMA, R. Ž. DJORDJEVIĆ, R. R. JANIĆ, D. S. MITRINOVIĆ, AND P. M. VASIĆ, *Geometric Inequalities*, Groningen, 1969.
[6] O. BOTTEMA, *On the Area of a Triangle in Barycentric Coordinates*, Crux. Math., **8**, (1982), 228–231.
[7] H. S. M. COXETER, *Barycentric Coordinates*, Introduction to Geometry, New York: Wiley., 2nd ed. 1969.
[8] D. K. KAZARINOFF, *A simple proof of the Erdös-Mordell inequality for triagngles*, Michigan Math. J., **4**, (1957), 97–98.
[9] V. KOMORNIK, *A short proof of the Erdös-Mordell theorem*, Amer. Math. Monthly., **104**, (1997), 57–60.
[10] H. LEE, *Another proof of the Erdös-Mordell theorem*, Forum Geom., **1**, (2001), 7–8. New York: Wiley, (1969), 216–221.
[11] S. J. LEON, *Linear Algebra with Applications*, Prentice Hall, New Jersey, (2005).
[12] J. LIU, *A new proof of the Erdös-Mordell inequality*, Int. Electron. J. Geom., **4**, 2 (2011), 114–119.
[13] J. LIU, *A weighted geometric inequality and its applications*, Journal of science and arts., **1**, 14 (2011), 5–12.
[14] J. LIU, *A sharpening of the Erdös-Mordell inequality and its applications*, Journal of Chongqing Normal University (Natural Science Edition)., **22**, 1 (2005), 12–14.
[15] J. LIU, *On inequality $R_p < R$ of the pedal triangle*, Math. Inequal. Appl., **16**, 3 (2013).
[16] L. J. MORDELL AND D. F. BARROW, *Solution of Problem 3740*, Amer. Math. Monthly., **44**, (1937), 252–254.
[17] D. S. MITRINOVIĆ, J. E. PEČARIĆ AND V. VOLENEC, *Recent Advances in Geometric Inequalities*, Kluwer Academic Publishers, Dordrecht-Boston-London, 1989.
[18] A. OPPENHEIM, *The Erdös-Mordell inequality and other inequalities for a triangle*, Amer. Math. Monthly., **68** (1961), 226–230.
[19] N. OZEKI, *On P. Erdös' inequality for the triangle*, J. College Arts Sci. Chiba Univ., **2** (1957), 247–250.

Paper JMI-08-05

[20] R. A. SATNOIANU, *Erdös-Mordell type inequality in a triangle*, Amer. Math. Monthly., **110** (2003), 727–729.
[21] J. WOLSTENHOLME, *A Book of Mathematical Problems on Subjects Included in the Cambridge Course*, London and Cambridge, 1867.
[22] Y. D. WU, *A new proof of a weighted Erdös-Mordell inequality*, Forum Geom., **8** (2008), 163–166.