Journal of
Mathematical
Inequalities
Volume 12, Number 1 (2018), 63–75 doi:10.7153/jmi-2018-12-05

NEW REFINEMENTS OF THE ERDÖS–MORDELL INEQUALITY

JIAN LIU

Abstract. In this paper, we present further extensions of two known refinements of the Erdös-Mordell inequality. Several other new refinements of the Erdös-Mordell inequality are established as well. Some closely related interesting conjectures which have been checked by computer are also proposed.

Mathematics subject classification (2010): 51M16.
Keywords and phrases: Erdös-Mordell inequality, triangle, interior point.

REFERENCES

[1] A. AVEZ, *A short proof of a theorem of Erdös and Mordell*, Amer. Math. Monthly. **100**, (1993), 60–62.
[2] F. F. ABI-KHUZAM, *A trigonometric inequality and its geometric applications*, Math. Inequal. Appl., **3**, (2003), 437–442.
[3] C. ALSINA, R. B. NELSEN, *A visual proof of the Erdös-Mordell inequality*, Forum Geom., **7**, (2007), 99–102.
[4] N. DERGIADES, *Signed distances and the Erdös-Mordell inequality*, Forum Geom.,**4**, (2004), 67–68.
[5] P. ERDÖS, *Problem 3740*, Amer. Math. Monthly. **42**, (1935), 396.
[6] S. GUERON, I. SHAFRIR *A weighted Erdös-Mordell inequality for polygons*, Amer. Math. Monthly. **112**, (2005), 257–263.
[7] W. JANOUS, *Further inequalities of Erdös-Mordell type*, Forum Geom., **4**, (2004), 203–206.
[8] V. KOMORNIK, *A short proof of the Erdös-Mordell theorem*, Amer. Math. Monthly. **104**, (1997), 57–60.
[9] J. LIU, *A new proof of the Erdös-Mordell inequality*, Int. Electron. J. Geom., **4**(2), (2011), 114–119.
[10] J. LIU, *On a geometric inequality of Oppenheim*, J. Sci. Arts. **18**(1), (2012), 5–12.
[11] J. LIU, *Sharpened versions of the Erdös-Mordell inequality*, J. Inequal. Appl., **2015**, 206(2015).
[12] J. LIU, *Refinements of the Erdös-Mordell inequality, Barrow's inequality, and Oppenheim's inequality*, J. Inequal. Appl., **2016**, 9(2016).
[13] L. J. MORDELL, D. F. BARROW, *Solution of Problem 3740*, Amer. Math. Monthly. **44**, (1937), 252–254.
[14] D. S. MITRINOVIĆ, J. E. PEČARIĆ, *On the Erdös Mordell's inequality for a polygon*, J. College Arts Sci, Chiba Univ., **B-19**, (1986), 3–6.
[15] D. S. MITRINOVIĆ, J. E. PEČARIĆ, V. VOLENEC, *Recent Advances in Geometric Inequalities*, Kluwer Academic Publishers, Dordrecht-Boston-London, 1989.
[16] B. MALEŠEVIĆ, M. PETROVIĆ, B. POPKONSTANTINOVIĆ, *On the Extension of the Erdös-Mordell type inequalities*, Math. Inequal. Appl., **17**, 269–281(2014)
[17] N. OZEKI *On Paul Erdös-Mordell inequality for the triangle*, J. College Arts Sci, Chiba Univ., **2**, (1957), 247–250.
[18] A. OPPENHEIM, *The Erdös-Mordell inequality and other inequalities for a triangle*, Amer. Math. Monthly. **68**, (1961), 226–230.
[19] R. A. SATNOIANU, *Erdös-Mordell type inequality in a triangle*, Amer. Math. Monthly. **110**, (2003), 727–729.
[20] A. SAKURAI, *Vector analysis proof of Erdös' inequality for triangles*, Amer. Math. Monthly. **8**, (2012), 682–684.

© ELEMENT, Zagreb
Paper JMI-12-05

[21] L. SI, B. W. HE, G. S. LENG, *Erdös-Mordell inequality on a sphere in* R^3, J. Shanghai Univ. Nat. Sci. **10**, (2004), 56–58.
[22] L. F. TÓTH, *Lagerungen in der Ebene auf der Kugel und im Raum*, Berlin, 1953.
[23] S. H. WU, L. DEBNATH, *Generalization of the Wolstenholme cyclic inequality and its application*, Comput. Math. Appl., **53**(1), (2007), 104-114.