

ANOTHER PROOF OF HÖLDER'S INEQUALITY

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Abstract. In this note, we introduce an idea of deriving some inequalities, using the discriminants of polynomials. This gives another proof of the famous Hölder's inequality.

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REFERENCES

- [1] A. CARBERY, *A multilinear generalisation of the Cauchy-Schwarz inequality*, Proc. Amer. Math. Soc. 132 (2004), no. 11, 3141–3152.
- [2] D. CHOI, *A generalization of the Cauchy-Schwarz inequality*, J. Math. Inequal. 10 (2016), no. 4, 1009–1012.
- [3] S. S. DRAGOMIR, *A survey on Cauchy-Bunyakovsky-Schwarz type discrete inequalities*, JIPAM. J. Inequal. Pure Appl. Math. 4 (2003), no. 3, Article 63, 142 pp.
- [4] J. HAN, J. SHI, *Refinements of Cauchy-Schwarz norm inequality*, J. Math. Inequal. 13 (2019), no. 4, 1095–1103.
- [5] N. HARVEY, *A generalization of the Cauchy-Schwarz inequality involving four vectors*, J. Math. Inequal. 9 (2), 2015, 489–491.
- [6] Z. LIU, *Remark on a refinement of the Cauchy-Schwarz inequality*, J. Math. Anal. Appl. 218 (1998), no. 1, 13–21.
- [7] M. MASJED-JAMEI, S. S. DRAGOMIR, H. M. SRIVASTAVA, *Some generalizations of the Cauchy-Schwarz and the Cauchy-Bunyakovsky inequalities involving four free parameters and their applications*, Math. Comput. Modelling 49 (2009), no. 9–10, 1960–1968.
- [8] R. G. SWAN, *Factorization of polynomials over finite fields*, Pacific J. Math. 12 (1962), 1099–1106.
- [9] S. YIN, *A new generalization on Cauchy-Schwarz inequality*, J. Funct. Spaces 2017, Art. ID 9576375, 4 pp.
- [10] S. YIN, *A note on generalized Cauchy-Schwarz inequality*, J. Math. Inequal. 11 (2017), no. 3, 891–895.