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Quadrilaterals and John Disks

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Abstract. Relations involving ordered quadruples of points on the boundary of a Jordan domain are investigated, and it is shown that these relations hold if and only if the domain is a John disk. In particular connections between absolute cross ratios and moduli of corresponding quadrilaterals are examined. A characterization of John disks based on a relation between diameters of subarcs of the boundary and bounds for moduli of associated quadrilaterals is also given. The results are one sided analogues to characterizations of quasidisks.

Keywords. John disk, quadrilateral, reversed triangle inequality, cross ratio, quasimöbius map, modulus, harmonic doubling condition.

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