1081-58-393 **Raymond T Walter*** (rwalter@uark.edu), PO Box 160, Clarkridge, AR 72623. *A Clifford Algebraic Approach to Moebius Transformations and Liouville's Theorem.* Preliminary report.

In elementary complex analysis one considers conformal mappings, those functions that preserve the measure and orientation of angles. Among the various conformal mappings in the complex plane are Moebius transformations. These transformations demonstrate such important properties as forming a group under function composition, mapping generalized circles to generalized circles, and forming an automorphism group of the Riemann sphere, the last of which has relevance in relativistic physics. By a famous theorem of Liouville, in Euclidean space of dimension greater than two the only conformal mappings are Moebius transformations. We will briefly review classical proofs of this result before presenting an alternative proof grounded in Clifford algebras. This is part of a more general result in pseudo-Euclidean space due to Jan Cnops in An Introduction to Dirac Operators on Manifolds. We include the exposition of this theorem and its proof in a more general scheme of characterizing Moebius transformations using Clifford algebras, first developed by Vahlen in 1902 and revisited by Ahlfors late in his career. This will require us to briefly review the relevant aspects of Clifford algebras before proceeding to the proof of Liouville's Theorem. (Received February 14, 2012)