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Jane Gilman* (gilman@nsf.gov), Mathematics Department, Smith Hall, Rutgers University, Newark, NJ 07079. *The Non-Euclidean Euclidean Algorithm*. Preliminary report.

Let G be a non-elementary two generator subgroup of $PSL(2, \mathbb{R})$. The discreteness algorithm determines whether or not G is discrete. It has both a geometric and an algebraic formulation. We re-interpret the algorithm as a type of *Euclidean Algorithm* using non-Euclidean distances given by translation lengths. The geometric discreteness algorithm thus becomes a *non-Euclidean Euclidean algorithm*. We show that this formulation of the algorithm simplifies the Gilman-Jiang proof of polynomial time complexity. (Received July 19, 2010)