

1067-20-338

Jane Gilman* (gilman@rutgers.edu), Mathematics Department, Smith Hall, Rutgers University, Newark, NJ 07102, and **Linda Keen**. *Enumerating Primitives and Palindromes in Rank Two Free Groups*.

An element of a free group F of rank two is *primitive* if it, along with another group element, generates the group. If $F = \langle A, B \rangle$, then a word $W(A, B)$ in A and B , is a *palindrome* if it reads the same forwards and backwards. It is known that in a rank two free group, for any fixed set of two generators a primitive element will be conjugate either to a palindrome or to the product of two palindromes, but known iteration schemes for all primitive words give only a representative for the conjugacy class. We derive a new iteration scheme that gives either the unique palindrome in the conjugacy class or expresses the word as a unique product of two unique palindromes that have already appeared in the scheme. We find necessary and sufficient conditions for any pair of words in the free group to be a primitive pair. The derivation of the enumeration scheme gives new proofs of known results about primitive words. (Received August 24, 2010)