1046-20-397   **Thomas Langley*** (`langley@rose-hulman.edu`), **David Levitt** and **Joseph Rower**. *The probability that a product of n group elements is equal to a rearrangement of itself.*

A beautiful property of finite groups is that the probability that two elements commute is either 1, or at most 5/8. We generalize the equation $ab = ba$ by viewing ba as a permutation of ab and asking: What is the probability that a product $a_1 a_2 \cdots a_n$ is equal to a fixed rearrangement of itself? The answer is surprisingly nice, generalizing the 5/8 bound in a natural way. (Received August 30, 2008)