1078-20-33   **Persi Diaconis***, Department of Statistics, Stanford University, Stanford, CA 94305. *When least is best.* Preliminary report.

In studying mixing times of random walk on groups, the following problem arises: Let G be a finite group and S a symmetric generating set. A random walk starts out at the identity and each time moves by translating by a randomly chosen element of S. After k steps, which element is least likely? For some G and S the computer shows that the answer is something like "the element farthest from the identity" (some conditions apply). Sometimes this can be proved (eg. for cyclic groups) but even for the generating set of transpositions on the symmetric group it has defeated us. This least likely element determines mixing time estimates. The parallel question for most likely is easy (for even k the walk is most likely to be back at the identity). All of this is from an ongoing conversation with Marty Isaacs. (Received November 02, 2011)