Disco I - WorkSheet 7

Oct 1, 1998- Professor Broughton

Name:_____ Box #:_____

1. How long does it take to shu - e?.

According to the discussion in the text and classroom work so far, we are pretty much guaranteed (though not absolutely) that we have a shu - ing set if:

1. The candidate shu - ing elements $\rho; \bar{}; \circ; : : :$ generate all of $S_{n:}$
2. The are not all even or odd, i.e., both $f\rho; \bar{}; \circ; : : :g \mu O_n$ and $f\rho; \bar{}; \circ; : : :g \mu E_n$ are false.

The transition matrix D is two big to work with to determine the length of time to shu - e but at least we can …nd out how long it takes to "mix the cards up" by studying the powers of the C matrix which is much easier too handle. The goal of this worksheet is to understand these ideas by trying to …nd as good a possible shu - ing pair or triple $S_{n:}$ as possible.

Thus pick various (at least 5) generating pairs $f\rho; \bar{}g$ or triples $f\rho; \bar{}; \circ g$ to shu - e an 8 card deck. On each of these selections, answer these questions:

1. Does the shu - ing set generate ?
2. Is there at least one even and one odd generator?
3. How long does it take to get C^k within .001 of the uniform distribution.

The scripts shufgen3.mgm and shfspeed.mws will be helpful. Organize your results into a table and make sure your try some ri‡e shu - es.