

Day 7 (July 11, 2012)

"Monday" shuffles	"Thursday" shuffles
a.k.a. out-shuffles	a.k.a. in-shuffles
Ex: 012345 --> 031425	Ex: 123456 --> 415263
52-card deck needs 8 shuffles to restore because $2^8 = 1 \pmod{51}$	52-card deck needs 52 shuffles to restore because $2^{52} = 1 \pmod{53}$
m -card deck will restore in n out-shuffles if $2^n = 1 \pmod{m-1}$ (if m even) $2^n = 1 \pmod{m}$ (if m odd) why do these behave differently?	m -card deck will restore in n in-shuffles if $2^n = 1 \pmod{m+1}$ why do these behave differently?