

Name: \_\_\_\_\_

Pid: \_\_\_\_\_

**Note that every statement in the homework should be proved.**

**The only exceptions are statements that were proven in previous homework or midterms and statements proven earlier in the class.**

1. Compute Grundy function for states of the subtraction game where players may subtract 1, 2 or 5 chips on their turn.

2. Compute Grundy function for the Nim position  $(1, 3, 5)$ .

3. Consider the following game: Alice and Bob are writing from left to right digits of a 11-digit number one by one. Alice wins if the number divides by 7 and Bob wins otherwise (Alice writes the first the digit). Determine who is the winner.