

Math 36

Homework 08

Game Theory: Impartial Combinatorial Games

1. Recall the take-away game (described in the lecture and on page 3, part I of the game theory handout). Consider the game starting with 33 tokens. Players are allowed to take away 1, 2, 3, or 4 tokens on their turn; the player who takes the last token wins. Is there a winning strategy for this game? Is it better to go first or second in this game?
2. Consider the game “Nimble”, described on page 12 of the game theory handout. Show that this game is just Nim in disguise. Can the next player to move win this game? If yes, what is her strategy? If not, does the other player have a winning strategy?