

Homework 1

Chapter 1, p.21: 2, 5, 8, 13, 30, 33, 35

Chapter 2, p.41: 5, 9, 14, 15, 17

Supplementary Exercises

1. For the game of Nim, let us restrict that each player can move one or two coins. Find the winning strategy for each player.
2. Let n be a positive integer. In the game of Nim let us restrict that each player can move only $i \in \{1, 2, \dots, n\}$ coins each time from one heap. Find the winning strategy for each player. (Hint: Use modulo integers and write them as base 2 numerals.)
3. Given $m(m-1)^2 + 1$ integral points on a plane, where m is odd. Show that there exists m points whose center is also an integral point.