

# Math576 Combinatorial Game Theory

## Homework 2

due midnight of Friday, Sept. 18, 2020

Submission method: Your answers to Homework 2 must be converted into a single pdf file. Then login to Blackboard. Click on assignments/homework2. Upload your answers. You can try to upload twice. Only last version will be graded.

1. Let  $C(2, n)$  be the game value of the rectangle  $2 \times n$  in the Cut Cake game. Prove  $C(2, n) = \lfloor \frac{n}{2} \rfloor - 1$  for all  $n \geq 2$ .
2. Two players are playing the cut cake game. The current game position consists of three rectangles:  $8 \times 4$ ,  $5 \times 3$ ,  $3 \times 8$ . What is the game value? If it is Left's turn now, what is his best move?
3. Find the game value of the rectangle  $990 \times 448$  in the Maundy Cake game.
4. For each case, find a pair of two fuzzy games  $G$  and  $H$  so that
  - $G + H > 0$ .
  - $G + H = 0$ .
  - $G + H < 0$ .
  - $G + H \parallel 0$ .
5. Two players are playing the Cut Cake game over an non-rectangle cake. What's the game value of the following cake?

