

# Math576 Combinatorial Game Theory

## Homework 3

due midnight of Friday, Oct. 2, 2020

Submission method: Your answers to Homework 3 must be converted into a single pdf file. Then login to Blackboard. Click on assignments/homework3. Upload your answers. You can try to upload twice. Only last version will be graded.

1. Simplify the following game values.

(a)  $\{0, *, *3, *4 \mid 0, *, *3, *4\}$

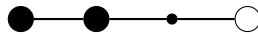
(b)  $*3 + *5 + *7$

(c)  $\{0, 1 \mid 1, 2\}$

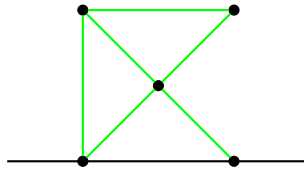
(d)  $\{-\frac{1}{2}, * \mid *\}$

(e)  $\{-1 + * \mid -1 + *\}$

2. Find the value of the following Col game:



3. Find the value of the following green Hackenbush game.



4. Two players are playing the Nim game with the following heaps:

2, 5, 6, 11.

- What is the game value of the current position?
- What is the winning move of the first player?

5. In the White Knight game, the Knight is at position g4 with a baggage of a Nim-heap of height 1.

- What is the game value of the current position?
- What is the winning move of the first player?