

# UW Math Circle

March 3, 2016

## Homework

1. Find a partner and play the following game on an  $8 \times 8$  chessboard. Start with a knight on square a1. On your turn, you can make any legal knight move, provided that the knight must always move up and to the right. The winning player is the one who can move the knight to square h8, or forces the other player to have no possible moves. Who wins?
2. Alice and Bob play a game where they start with the number 1000 and take turns subtracting a power of 2 from the number. The first person who reaches a number that less than or equal to 0 loses. Which player wins?
3. Charles and Danielle are playing a game with letters. Charles starts with the letter A. On his turn, he can choose a letter 'A' or 'B' and attach it to the end of the current word. On Danielle's turn, she can either switch the position of any two letters, or do nothing. The game continues until the "word" is 2015 letters long. If that word is a palindrome Danielle wins, otherwise Charles wins. Who wins?