

HOMEWORK 12 : BETHUNE 1800 : MARCH 11, 2010

DUE: MARCH 18, 2010

Assume that rock paper scissors (RPS) is a fair game where each player has a probability of $\frac{1}{2}$ of winning.

- (1) Say you are playing RPS but you don't agree in advance with your opponent how many rounds you are playing . If you throw and win, you stop the game and win. If you lose the throw then you tell your opponent it was 'best two of three' and throw again. (yes, this is cheating) What is your probability of winning this game?
- (2) Same question except you say it was 'best three of five' instead of 'best two of three.' What is your probability of winning this game ?
- (3) Say that you are playing a fair game 10 times and you start with \$10. At each round you will either win one dollar or lose one dollar. The best you can do is double your money. The worst you can do is lose it all.
 - (a) What is your probability of coming out even at the end of 10 rounds (that is you finish with the same amount you start with)?
 - (b) What is your probability of ending up with between \$9 and \$11?
 - (c) What is your probability of coming out ahead after 10 rounds?
 - (d) What is your probability of coming out at least \$5 ahead at then end of the 10 rounds?
 - (e) What is your probability of doubling your money?(note that (c) is equivalent to asking what is the probability that you come out behind and (e) is equivalent to asking the probability of losing all your money)