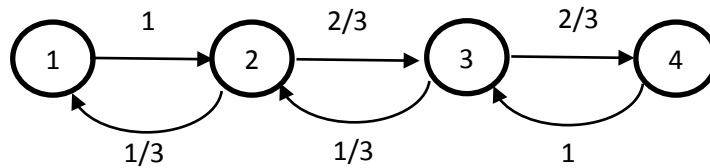# 553.633/433

Homework #4

Due Wed. 9/26/18

Three problems:

A. (Random walk with reflecting walls) Suppose there are four states 1, 2, 3, 4 in a line. If you are at one of the endpoints you always move inward in the next step. If you are at one of the inside points you move left with probability 1/3 and right with probability 2/3.

Answer the following:
(a) What is the Markov transition matrix?
(b) In the long run, what is the probability of being in each state?
(c) If you start at state 3, what is the probability that you do not return to state 3 within 5 steps?

2.19. Note that the largest acceptance probability is obtained with the smallest possible $C \geq 1$.

2.22. In addition to parts (a) and (b), also generate a histogram of 10,000 accepted points from the A-R method; use 40 vertical bars in the histogram over the domain $[0, 5/2]$. Submit your code with the HW.