

Homework 1

Do the problems on webwork and turn the following problems in class on Jan. 31st.

Homework should be written neatly and clearly explained. If it requires more than one sheet, the sheets must be stapled. Include your name and id number in the top right corner of your homework.

Problem 1. You have an 8×8 chessboard and a token in the lower right corner square. You want to move it to the top left corner square.

- a) How many ways can you move the token if, in each move you're only allowed to move the token one square to the left or one square up?
- b) In how many ways can you move the token if you're additionally allowed to move the token diagonally (in one move you can also move it to the adjacent "left up" square).

Problem 2. On a lottery ticket you choose and circle five numbers out of the numbers 1, 2, 3, ... 39, 40. The next day at the lottery five numbers are chosen at random (with all combinations having the same probability) out of the numbers 1, 2, 3, ... 39, 40. You win the prize if on your lottery ticket you have guessed exactly two out of these five numbers.

1. How many possible outcomes are there of the drawing?
2. How many ways can two of your numbers be chosen?
3. How many ways can the three numbers not from your list be chosen?
4. How many of the outcomes contain exactly two of your numbers?
5. What is the probability you win the prize?