MATH413 HW 1

due **Jan 30** before class

1: How many ways are there to pick a man and a woman who are not husband and wife from a group of n married couples?

2: How many nonempty words can be formed from three As and five B's? *(not all letters must be used)*

3: How many ternary (0,1,2) sequences of length 10 are there without any consecutive digits the same?
(Ternary means using digits 0,1,2. Similarly, binary would mean just digits 0,1.)

4: What is the probability that if one letter is chosen at random from the word RECURRENCE and one letter is chosen from RELATION, the two letters are the same?

5: How many different outcomes are possible when a pair of dice, one red and one white are rolled two consecutive times?
(Consider that first and second roll are distinguishable as well as the case where they are not - so it would correspond to having two red and two white dices)

6: Construct a perfect cover of an 8-by-8 chessboard with dominoes (1×2) having no fault-line.
(Fault line is cutting the board but not any domino. See Page 7 in the book and Figure 1.5.)

7: Construct a pair of orthogonal Latin squares of order 4.

8: Show that there is no magic cube of order 2.