

Mth 21, Homework 2 on sections 2.3, 2.4

Due by Wed, Sept 20.

Write all your working out and answers on your own notepaper. Please use lots of space and as many pages as you want, so I can include corrections or comments - otherwise I will ask you to redo it. You do not need to write the questions, but it is very important that you explain your answers and show clearly any work you had to do. Each question is worth 3 points for a total of 21.

- (1) In a certain sandwich shop you much choose from 4 types of bread, 3 types of meat, 3 kinds of cheese and 5 sauces. How many different kinds of sandwiches is it possible to order?
(Hint: You can use the boxes method from the Fundamental Principle of Counting.)
- (2) A serial number consists of two letters followed by an X or a Y and then three digits with no digit repeated. For example, a possible serial number here is TQY274. What is the total number of possible serial numbers?
- (3) Forty women run in the olympic marathon final. How many ways can the gold, silver and bronze medals be awarded?
- (4) Compute ${}_7P_3$ which is the number of ways to arrange 3 things selected from 7.
(Hint: You can use the formula ${}_nP_r = n!/(n-r)!$ or the Fundamental Principle of Counting.)
- (5) How many ways can you arrange the six books on your small bookshelf?
- (6) (a) Compute the combination number ${}_9C_4$ using its factorial formula.
(b) Explain what this number counts in your own words.
(c) Give an example of a question that would have this number as an answer.
- (7) How many ways are there to select 3 people from 20 job applicants if
 - (a) the order of selection is not important,
 - (b) the order of selection is important?(Hint: Can you see which one needs permutations and which needs combinations?)

If you get stuck on a question or aren't sure if you understand it:

- Go over the relevant class notes and section in the textbook.
- Check if you get the right answer for a similar odd-numbered question in the textbook (answers at the back of the book).
- Ask me about it after class.
- Come to my office hours: Mon 11:30 - 12:30, Wed 11:30 - 12:30 in CP 317.
- Go to the Math Tutorial Lab in-person in CP 303 or online.