

Counting – Exercises (2 pages; 7/7/20)

Key to difficulty:

* easier

** moderate

*** harder

(1**) An exam candidate is supposed to answer 4 questions out of 5 in Section A, 3 out of 4 in Section B, and 2 out of 3 in Section C. If they don't read the instructions properly and answer 9 questions at random from the paper, what is the probability that they answer the questions they are supposed to?

(2***) (i) 3 different sweets are to be shared amongst 5 children. In how many ways can this be done, if no child is to receive all 3 sweets?

(ii) What is the answer if the 3 sweets are indistinguishable?

(3***) When choosing the venue for an international conference, 3 countries are shortlisted at random from a list of 9, of which 4 are European and 5 are from the rest of the world. What is the probability that at least 2 of the countries shortlisted are European?

(4***) The following books are on a bookshelf: 4 novels, 3 history books, 2 biographies and 1 dictionary. In how many ways can they be arranged if the novels have to be together, and similarly for the history books and biographies?

(5**) 3 bananas, 4 apples and 5 oranges are to be arranged in a row. In how many ways can this be done, assuming that the bananas etc are indistinguishable?