

Please explain briefly but clearly your reasoning (unless it is totally obvious from your answer, i.e., when you have to list the elements of a set or to draw a set in the plane).

Please write the problems in the same order as they are given in the assignment.

Note that the odd-numbered problems have answers at the end of Hammack's book. I strongly suggest that you do *all* odd-numbered problems for practice; moreover, many of them are very similar to the assigned homework problems.

Hammack, Section 3.3: Exercises 2, 4, 6, 8, 10.

Hammack, Section 3.4: Exercises 8, 10, 12, 14.

Hammack, Section 3.5: Exercises 8, 10, 16.

A general remark: Counting problems are not easy. Please start working on the homework early. Explain your reasoning; there is no need of complete sentences, but please write some words to justify your solution.

Do not forget that the odd-numbered problems are solved at the end of the book – use them to practice!

Here is, for example, a good solution of Exercise 3.3/7:

$$\begin{aligned} & \#(\text{5-letter passwords with at least one uppercase letter}) \\ &= \#(\text{5-letter passwords}) \\ &\quad - \#(\text{5-letter passwords made only of lowercase letters}) \\ &= (26 + 26)^5 - 26^5. \end{aligned}$$

Here is a good solution of Exercise 3.5/11:

First choose the positions of the three 6's – this can be done in $\binom{10}{3}$ ways. Then fill the remaining $(10 - 3) = 7$ slots, choosing from 8 digits, namely, from $\{1, 2, 3, 4, 5, 7, 8, 9\}$ (no 0 and no 6), with repetition allowed – this can be done in 8^7 ways. The answer is $\binom{10}{3} \cdot 8^7$.