

**Homework 1**

**Problem 1:** Prove the finite version of DeMorgan's Laws. Let  $A_1, \dots, A_n \subset \mathcal{S}$ . Prove that

$$(i) (\cup_{i=1}^n A_i)^c = \cap_{i=1}^n A_i^c, \quad (ii) (\cap_{i=1}^n A_i)^c = \cup_{i=1}^n A_i^c.$$

**Problems 2-5:** numbers 1.13, 1.24, 1.26 and 1.34 from the textbook.

**Problem 6.** You roll two fair dice hoping for a total of 7 (probability  $1/6$ ). After the roll one die is hidden, but you see that the other is a 4. What is the (updated) chance that you have a total of 7? What is the (updated) chance that the total is  $n$  ( $n = 1, 2, \dots$ )?

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Please label each page of your homework clearly with your name IN BLOCK CAPITALS and your UIN. If you use more than one sheet of paper, please staple the sheets together.