M362K Homework Assignment #2

Please, provide your **complete solutions** to the following problems. Final answers only, even if correct will earn zero points for those problems.

Problem 2.1. (5 points) Complete the definition of *mutual exclusivity* of events below:
Events $A, B \subset \Omega$ are said to be *mutually exclusive* if ...

Problem 2.2. (5 points) An urn contains 1 red ball and 10 blue balls. Other than their color, the balls are indistinguishable, so if one is to draw a ball from the urn without peeking - all the balls will be equally likely to be selected. If we draw 5 balls from the urn at once and without peeking. What is the probability that this collection of 5 balls contains the red ball?

Problem 2.3. (15 points) Consider a an ordinary deck of 52 cards. It consists of 4 suits, each containing 13 cards, and it has 13 kinds (or ranks) of cards - one of every kind in each suit. A poker hand is a set of 5 cards from the above deck. It does not matter in which order the cards were dealt. Assume that all poker hands are equally likely.

What is the probability that in a poker hand, one gets exactly 3 of a kind, i.e., 3 of the same rank, with the remaining two cards being of different ranks?

Problem 2.4. (5 points) Solve Problem **1.4.6** from the textbook.

Problem 2.5. (10 points) Solve Problem **1.4.8** from the textbook.

Problem 2.6. (5 points) Solve Problem **1.4.12** from the textbook.

Problem 2.7. (5 points) A pair of dice is thrown. Find the probability that the sum of the outcomes is 10 or greater **if** a 5 appears on at least one of the dice.