

PHYS 461: Homework # 6

6.1 The numbers $1, 2, \dots, n$ are arranged in random order. What is the probability that the sequence $1, 2, 3, 4$ appears in that order anywhere in the arrangement?

6.2 An urn contains 10 balls numbered $0, 1, 2, \dots, 9$. If nk balls are successively drawn with replacement, what is the probability $p(k, n)$ to obtain the sequence of k digits (c_1, c_2, \dots, c_k) ? What is the limit of $p(k, n)$ when, for a fixed value of k , n tends to infinity?

6.3 At a bridge table each of the four players receive 13 cards. What is the probability that each player receives an ace?

6.4 An urn contains b blue balls and r red balls. After a first ball of unknown color has been drawn without replacement, a second ball is drawn. What is the probability that it is a blue ball?

6.5 Initially, an urn contains only one red ball. We flip a coin. If the result is tail, a blue ball is added to the urn, if it is head, a ball is drawn from the urn. What is the probability to draw the red ball?