Math 461 Spring 2024

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Solution to HW5 is on my homepage.

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Chapter 1: the multiplication rule; permutations; combinations; binomial theorem; multinomial theorem.

Chapter 2: basic properties of probability measures; sample spaces with equally likely outcomes; inclusion-exclusion formula. In some problems, when ordering is not explicitly mentioned, you maybe able to solve the problems by either thinking that order is relevant, or by thinking that order is irrelevant. But you need to be consistent. If order is relevant for the numerator, order must be relevant for the denominator also. Do not mix-match them.

conditional probability; using conditional probability to find probabilities of intersections; Bayes' formula; independence; independent trials; using conditioning as a tool to find probabilities of (complicated) events.

Chapter 4: random variables, distribution functions; discrete random variables; probability mass functions; expectations; variances; find the expectation of a function of a discrete random variable X given the mass function of X; basic properties of expectations and variances; Bernoulli random variables; binomial random variables; Poisson random variables; Poisson approximation to binomial random variables, geometric random variables, negative binomial random variables; finding the expectation of random variables by decomposing them as sums of simpler random variables.

memorize basic facts, like mass function, expectation and variance; about Bernoulli random variables; binomial random variables; Poisson random variables; Poisson approximation to binomial random variables, geometric random variables, negative binomial random variables.

Basic relations between various classes of random variables: between Bernoulli and binomial; between geometric and negative binomial;