

Math 107. Review sheet for the first midterm

Chapter 3. Sections 1, the first part of 3, 5, 6, 7.

Problems: R2, R13, R19, 3.82.

Chapter 4. Sections 2, 3, 4.

Comments. Keep in mind the difference between combinations, when we choose a subset of a given set (e.g., we select a team of three people), and permutations where we form a sequence (i.e., an ordered set) from of the elements of a given set (e.g., when we choose president, vice-president, and treasurer of some organization).

Recall the definition of binomial coefficients and how to compute them.

Be sure you know when to add and when to multiply two numbers if you count all the possibilities.

Problems: R54, R55, R58, R59, R69, R71.

You should also be able to solve problems of the following type:

We select at random 5 cards from a deck of 52 cards. Find the probability that:

- (i) *we will have at most one ace;*
- (ii) *we will have precisely one spade and two clubs;*
- (iii) *we will have three diamonds and suits of the two remaining cards are different.*

Chapter 5. Sections 1–3, 4–9.

Comments. You should know operations on events (e.g., how to find $A' \cup B$ given events A and B), and how to ‘fill in’ Venn diagrams and read from them the probabilities of events.

Be sure you know the definition of conditional probability.

Remember that two events A and B are independent if $P(A \cap B) = P(A)P(B)$. Thus, if we are to decide whether the events A and B are independent we should compute three probabilities $P(A \cap B)$, $P(A)$, $P(B)$ and check if the equation $P(A \cap B) = P(A)P(B)$ holds.

Do not confuse independent events with mutually exclusive events. There are two different notions!

Recall how to ‘read’ probabilities from tables.

Finally, be sure you understand how to solve problems on Bayes’ theorem.

Problems: 5.3, 5.25, 5.59, 5.63, 5.65, 5.87, 5.89. 5.91, R62.

Review problems for Chapter 3 are on pages 101–109. Review problems for Chapters 4 and 5 can be found on pages 187–190.