

Math 109-003
Assignment 2

Covers: Sections 4.3-4.6, 5.1-5.2
Due: Mon Feb 23 at 8:30am

INSTRUCTIONS:

This assignment will be marked for completion.

Solutions will be posted on the course website 24 hours after the deadline.

You may not copy the work of another person or AI.

Submit jpg or pdf files to the D2L Dropbox.

1. The letters A,B,C,D,E,F are randomly re-arranged. Find the probability that the first three letters are A,B,C, in some order.
2. Six social media accounts each randomly choose one of 20 avatars. What is the probability that at least two of the accounts choose the same avatar?
3. At a certain company:
55% of employees have been promoted recently,
72% of employees are college graduates, and
33% of employees are college graduates and have been promoted recently.
Find the probability that an employee who has been promoted recently is a college graduate.
4. A product has two independent parts. In one year of use, Part A fails 3% of the time and Part B fails 8% of the time. Find the probability that:
 - a) no part fails in one year of use.
 - b) at least one part survives a year of use.
5. Thirty percent of the emails you receive are junk. Ninety percent of junk mail is automatically moved to the Junk folder. One percent of non-junk mail is automatically moved to the Junk folder. If an email was automatically moved to the Junk folder, find the probability that it is actually junk.
6. An unfair four-sided die has a 10% probability of rolling a 1, a 20% probability of rolling a 2, a 30% probability of rolling a 3, and a 40% probability of rolling a 4. You pay \$5 to roll the die. The number of dollars you win is twice the number rolled. For example, if you roll a 2 then you win \$4. Let X be your net winnings (in dollars).
 - a) Find the probability distribution of X .
 - b) Find the expected value of X .
7. A multiple-choice test has eight questions, with four possible answers for each question. A student guesses randomly on each question. Find the probability that the student gets at least three questions correct.