MTH 2300 – Chapter 5 Problems

Think of this problem set as a “Practice Exam”.
These problems will not be collected or graded. Solution sheets will be available on Review Day.

1. Does the function \( P(x) = .1x! \) form a probability distribution for \( x = 0, 1, 2, 3 \)?
   Show the calculations and explain in words why \( P(x) \) is or is not a probability distribution.

2. We surveyed a number of homes. The probabilities of finding 0, 1, 2, 3, or 4 telephone extensions in these homes is 0.02, 0.38, 0.30, 0.20, and 0.10 respectively. Find the mean and standard deviation of the number of telephone extensions.

3. Four people work in your office. The probability of getting the flu this winter is 17%. Assume this is a situation where the binomial model is valid.
   a. Make a probability distribution for the number of people who get the flu.
   b. Find the mean and standard deviation of the number who get the flu.
   c. What is the probability that at least two people in your office will not get the flu?
      \[ \text{Hint: The probability distribution in Part "a" is for the number who do get the flu.} \]

4. \[ \text{Hint: The Binomial Table in the back of the book will make your work easier. According to the State Department, 40\% of all American adults have a passport. If we select nine American adults at random, find the probability that:} \]
   a. exactly two do not have a passport
   b. at most 3 have a passport
   c. at least 2 do not have a passport
   d. at least 1 but less than 6 have a passport