**Probability and Statistics Homework III:**

(Due Dec 5, 2023)

4.4

Six men and 4 women are ranked according to the time they took to complete a 5-mile trail run. Assume that no two individuals took the sme time and that all 10! possible ranks are equally likely. What is the probability that at leat one out of the three highest ranking individuals is a woman?

4.7

Suppose that a die is rolled twice. What are the possible values that the following random variables can take on:

1. the maximum value to appear in the two rolls;
2. the minimum value to appear in the two rolls;
3. the sum of the two rolls;
4. the value of the first roll minus the value of the second roll?

4.17

Suppose that the distribution function of the random variable X is give



1. Find P{ X < 1 }
2. Find P { X > 2 }
3. (c) Find P｛1/3　<　X < 5/3｝

4.19

If the distribution function of the random variable X is given by



Calculate the probability mass function of X.

4.44

A communication channel transmits the digits 0 and 1. However, due to static, the digit transmitted is incorrectly received with probability .2. Suppose that we want to transmit an important message consisting of one binary digit. To reduce the chance of erro, we transmit 00000 insttead of 0 and 11111 instead of 1. If the receiver of the message uses “majority” decoding, what is the probability that the message will be wrong when decoded? Wat indpedence asusmptions are you making?

4.60

Suppose that the number of weekly traffic accidents occruing in a small town is a Poisson random variable with parameter λ= 7.

1. What is the probability that at least 4 accidents occur (until) this week?
2. What is the probability that at most 5 accidents occur (until) this week given that at least 1 accident will occur today?