

STAT 2910 SAMPLE MIDTERM

October 13, 2023

Chapter 4

Probability and Probability Distributions

1. An experiment involves tossing a single die. These are some events:

- A: Observe a 2
- B: Observe an even number
- C: Observe a number greater than 2
- D: Observe both A and B
- E: Observe A or B or both
- F: Observe both A and C

Questions

- a. List the simple events in the sample space
 - b. List the simple events in each of the events A through F
 - c. What probabilities should you assign to the simple events
 - d. Calculate the probabilities of the six events by adding the appropriate simple-event probabilities
2. A sample space S consists of five simple events with these probabilities:

$$P(E_1) = P(E_2) = 0.15$$

$$P(E_3) = 0.4$$

$$P(E_4) = 2P(E_5)$$

Questions

- a. Find the probability for the simple events E_4 and E_5
- b. Find the probabilities for these two events:

$$A = (E_1, E_3, E_4)$$

$$B = (E_2, E_3)$$

- c. List the simple events that are either in event A or event B or both
 - d. List the simple events that are either in both event A and event B
3. A sample space contains 10 simple events: E_1, E_2, \dots, E_{10} . If $P(E_1) = 3P(E_2) = 0.45$ and the remaining simple events are equiprobable, find the probabilities of these remaining simple events