

# Homework 1

BSTA 512

2024-01-18

## Directions

Please [turn in this homework on Sakai](#). Please submit your homework in pdf format. You can type your work on your computer or submit a photo of your written work or any other method that can be turned into a pdf. Please let me know if you greatly prefer to submit a physical copy. We can work out another way for you to turn in homework.

Complete all of the problems listed below. Only turn in the ones listed in the “Turn In” column. Please submit problems in the order they are listed.

*You must show all of your work to receive credit.*

Chapter	Turn In	Extra Problems
1		# 3, 7, 9, 11
2	NTB # 1, TB # 30	# 1, 4, 8, 16, 19, 23

## Non-textbook problems (NTB)

1. Suppose the following are the percentage of US adults with the following conditions:
  - $A$ : Hypertension 33%
  - $B$ : Diabetes 9%
  - $C$ : Metabolic syndrome 24%
  - $A$  or  $B$ : 39%
  - $A$  or  $C$ : 45%
  - $B$  or  $C$ : 28%

- $A$  or  $B$  or  $C$ : 48%
- a. Make a Venn diagram of the 3 conditions labeling the percentage (or probability) for *ALL* of the 8 “sections”. *Hint: Start from the last condition and work your way up!*
  - b. For each of the following (1. - 7. below), (i) write out the event using unions, intersections, and/or complements of the events  $A$ ,  $B$ , and  $C$  (this is NOT finding the probability, that’s in ii); (ii) find the probability of the event; and (iii) write a sentence explaining what the probability is of in terms of the context of the problem.
    1.  $\mathbb{P}(\text{event at least one of the 3})$
    2.  $\mathbb{P}(\text{event none})$
    3.  $\mathbb{P}(\text{event } A \text{ only})$
    4.  $\mathbb{P}(\text{event exactly one})$
    5.  $\mathbb{P}(\text{event } A \text{ and } B)$
    6.  $\mathbb{P}(\text{event } A \text{ and } B \text{ but not } C)$
    7.  $\mathbb{P}(\text{event all 3})$

### Some select answers

Selected answers (or hints) not provided at the end the book:

- Chapter 2
  - # 4: 0.35
  - # 8: 0.03125
  - # 16: 0.48
  - # 30: (a) 0.189    (b) 0.811    (c) 0.189