

Name: \_\_\_\_\_

TA Name: \_\_\_\_\_

Secret Word: \_\_\_\_\_

# Data 88S

Feb 14, 2024

## Chapter 3, Exercise 9

1. A coin is tossed 200 times. Let  $X_1$  be the number of heads in the first 100 tosses and let  $X_2$  be the number of heads in the last 100 tosses.

(a) True or false (explain):  $X_1 = X_2$

(b) Do  $X_1 = X_2$  have the same distribution? Why or why not?

2. A random variable  $W$  has the distribution shown in the table below.

$w$	-4	-2	0	1	3
$P(W = w)$	0.1	0.25	0.3	0.25	0.1

(a) Sketch a graph of the cdf of  $W$ .

(b) Write down the values of:

i.  $F(0)$

ii.  $F(2)$

iii.  $P(W \leq 1)$

iv.  $P(W \geq 1)$

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### Chapter 4, Exercise 4

3. In a “best of seven” sports series, Team A plays Team B until one team has won four games. That team wins the series. Assume that in each game Team A has chance 0.8 of winning, independently of other games.
- (a) Find the chance that there is a “sweep”, that is, one team wins the first four games.
  - (b) Find the chance that the series lasts more than five games.
  - (c) Find the chance that the series lasts six games and Team A wins it.
  - (d) Find the chance that Team A wins the series.

### Chapter 3, Exercise 4

4. Akaash bets a dollar repeatedly on a “split” at roulette.
- Each time he bets, his chance of winning is  $2/38$  independently of other times.
  - Each time he wins a bet, his net gain is 17 dollars.
  - Each time he loses a bet, he loses a dollar; that is, his net gain is -1 dollars.

Suppose he bets 90 times. What is the chance that he makes money? In other words, what is the chance that his total net gain is positive?