

STAT 3115C – Homework 3

Due February 19

Instructions:

Please include the following information on the first page of your completed homework.

- Name
- STAT 3115C
- Homework 3

Please remember to show your work and explain answers as necessary. Answers that are not supported by good reasoning will not receive full credit. Homework should be stapled if it is longer than one page.

Section 2.5: 77

Section 3.1: 10

Section 3.2: 12, 14

1. Suppose the pmf of a random variable X is given by

x	0	1	2	3	4	5	6	7
$P(X = x)$	0.1	0.15	0.15	0.2	0.1	0.1	0.15	c

- (a) Assuming no other values for X are possible, find the value of c which makes this a valid pmf.
- (b) Derive the cdf of X and write it in functional form.
- (c) Find the following probabilities:
- $P(X \geq 4)$
 - $P(X = 4)$
 - $P(2 \leq X \leq 5)$
 - $P(X \geq 0)$
2. Suppose the cdf of a random variable X is

$$F(x) = \begin{cases} 0, & \text{if } x \leq 1, \\ 0.3, & \text{if } 1 \leq x < 3, \\ 0.4, & \text{if } 3 \leq x < 4, \\ 0.45, & \text{if } 4 \leq x < 6, \\ 0.6, & \text{if } 6 \leq x < 12, \\ 1, & \text{if } x \geq 12 \end{cases}$$

- (a) Find the pmf of X . Give it either in function or tabular form.
- (b) Find the following probabilities:
- $P(X = 3)$
 - $P(X > 3)$
 - $P(3 \leq X \leq 6)$