Homework 8 Answers

BSTA 550

Chapter	Turn In	Extra Problems
25	TB # 18, NTB # 1	# 1, 4, 8, 17, 23, 24 Slide examples: 2, 3.3, 4
26*	TB # 12**, NTB # 2, 3	# 7, 9, 19, 20 Slide examples: 3
27	TB # 12***	# 6, 8, 13, 17 Slide examples: 1.2
28	TB # 18	TB # 1, 10
29	NTB #4	
30		TB # 4, 7-12

* Although within Chapter 26, these exercises are primarily practicing the material from Chapter 25.

** For this problem, you only need to set up the integrals!!

*** For Ch 27 # 12, in order to find the conditional densities in parts (a) and (b), you will need to calculate $f_Y(y)$ for the specific regions of y specified. After finding the conditional densities in parts (a) and (b), also calculate the conditional probabilities below. Please submit these together with your other work in parts (a) and (b): Find $\mathbb{P}[0.5 < X < 3|Y = 4]$. Find $\mathbb{P}[0.5 < X < 3|Y = 7]$.

Non-textbook problems

- #1:

Textbook problems

There are answers at the back of the book!! Selected answers (or hints) not provided at the end the book:

- Chapter 25
  - # 4: 7/16
  - # 8: (a) $\frac{25}{228}$ (b) $f_X(x) = \frac{1}{12}(x+1)$, for $0 \le x \le 4$ (c) $f_Y(y) = \frac{3}{76}(y^2+1)$, for $0 \le y \le 4$
  - # 18: 5/6
  - # 24: (a) $f_X(x) = -2e^{-2x} + 2e^{-x}$, for $x \ge 0$ (b) $f_Y(y) = 2e^{-2y}$, for $y \ge 0$
- Chapter 26
  - # 12: (b) $\frac{233}{256}$ (c) $\frac{65}{256}$ (d) $\frac{1}{512}$
  - # 20: (a) Yes. (b) $\frac{15}{16}$
  - NTB # 3: (b) 0.09999546 (d) $f_Z(z) = \left(\frac{11}{5} - \frac{2z}{5}\right)e^{-2z}$, for what values of z?
- Chapter 27
  - # 6: $f_{X|Y}(x|y) = \frac{e^{-x/4-y/5}}{4(e^{-y/5}-e^{-9y/20})}$, for $0 < x < y$
  - # 8: $f_{X|Y}(x|y) = \frac{1-x^2}{1-y-\frac{(1-y)^3}{3}}$, for $0 \le x, 0 \le y, x+y \le 1$
  - # 12: (a) $f_{X|Y}(x|y) = \frac{1}{2}$ (c) $\frac{4}{7}$
- Chapter 28
  - # 10: (a) 8/9 (b) 14/3
  - # 18: 4/5
- Chapter 29
  - # 10: (a) 26/81 (b) 74/9
  - # 14: (a) 67/3 (b) 1/14 (c) 25/12 (d) $\sqrt{25/12}$
  - # 26: 250
  - # 32: See notes (or book) for the proof from the discrete random variables case. The proof doesn't depend on what type of random variable (discrete vs. continuous) is being used.

- NTB # 3: (a) 63 (b) 287/3 (c) -1, 41/3 (d) -7, 287/3

- Chapter 30
  - # 4: $f_x(x) = 1/2$ for $2 \leq x \leq 4$
  - # 8: (a) T (b) T (c) F
  - # 10: (a) F (b) T
  - # 12: (a) T (b) T (c) F (d) T