Homework 8 Answers

BSTA 550

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 $0 \leq x \leq 4$ (c) $f_Y(y) = \frac{3}{76}(y^2+1)$, for $0 \leq y \leq 4$
  - # 18: 5/6
  - # 24: (a) $f_X(x) = -2e^{-2x} + 2e^{-x}$, for $x \geq 0$ (b) $f_Y(y) = 2e^{-2y}$, for $y \geq 0$
- 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 $0 \leq x, 0 \leq y, x+y \leq 1$

- # 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

- Chapter 31
  - # 14: (a) 0.25 (b) 0.02887 (c) 0.063 (d) 0.0145 (e) 0.01625 (f) 0.0055 (f) 6.195 (g) 0.00433 (h) 61.95 (i) 0.0433
  - # 17: 2.25
  - # 18: 7/15

- Chapter 32
  - # 8: 0.2526
  - # 5: 0.8047
  - # 10: 0.4323

- Chapter 33
  - #10: (a) $f_x(x) = \frac{x}{9}e^{-x/3}$ for $x > 0$ (b) 0.4963

- Chapter 35
  - # 6: (a) 0 (b) -1.13 (c) ± 0.32
  - # 10: (a) 0.0475 (b) 0.0475 (c) 0.2283 (d) 68.97 to 81.03 (e) 48 to 102 (f) 68.97
  - # 24: (a) 0.2119 (b) 0.0011
  - NTB # 5: 0.002
- Chapter 36
  - # 4: 0.0044
  - # 12: (a) 0.9525 (b) 0.7939 (c) 0.7939
  - # 14: 0.5911
  - # 16: (a) $R = 8.225\sigma + 25\mu$ (b) $R = 16.45\sigma + 100\mu$ (c) $R = 164.5\sigma + 10,000\mu$ (d) $R = 1.645\sqrt{n}\sigma + n\mu$
- Chapter 37
  - # 2: 0.8869
  - # 4: 0.0023
  - # 20: 0.3936
  - # 24: 0.4562
  - # 30: (b) 0.0022 (c) $478.696 \approx 479$