

MATH 323: PROBABILITY

SUITABLE TEXTBOOK PROBLEMS

Numbering refers to Edition 7 of the textbook.

1. Chapter 1.

- (i) **Events and Sample Spaces:** 2.1 – 2.8 (pp 25 – 26)
- (ii) **Basic Probability:** 2.9 – 2.19 (pp 32 – 34)
- (iii) **Counting and combinatorial methods:** 2.25 – 2.66 (pp 39 – 40, 48 – 51)
- (iv) **Conditional Probability:** 2.71 – 2.77, 2.82 – 2.83 (pp 54 – 57)
- (v) **Probability manipulations:** 2.84 – 2.99, 2.101 – 2.103, 2.105 – 2.109 (pp 59 – 62)
- (vi) **Multiple events:** 2.110 – 2.121 (pp 68 – 69)
- (vii) **Theorem of Total Probability & Bayes Theorem:** 2.128 – 2.130, 2.132 – 2.137 (pp 74 – 75)

2. Chapter 2.

- (i) **Random variables and pmfs:** 3.1 – 3.8 (p 90), 3.10 – 3.11 (p 91)
- (ii) **Expectations:** 3.12 – 3.34 (pp 97 – 100)
- (iii) **The Binomial distribution:** 3.35 – 3.53 (pp 110 – 112)
- (iv) **The Geometric distribution:** 3.66 – 3.84 (pp 119 – 120)
- (v) **The Negative Binomial distribution:** 3.90 – 3.97 (pp 123 – 124)
- (vi) **The Hypergeometric distribution:** 3.102 – 3.118 (pp 128 – 130)
- (vii) **The Poisson distribution:** 3.121 – 3.139 (pp 136 – 137)
- (viii) **Generating functions:** 3.145 – 3.161 (pp 142 – 143)
- (ix) **Continuous random variables:** 4.1 – 4.19 (pp 166 – 169), 4.20 – 4.33 (pp 172 – 173)
- (x) **The Uniform distribution:** 4.38 – 4.55 (pp 176 – 178)
- (xi) **The Normal distribution:** 4.58 – 4.80 (pp 181 – 184)
- (xii) **The Gamma distribution:** 4.84, 4.88 – 4.96, 4.99, 4.103 – 4.106, 4.108 – 4.112 (pp 189 – 194)
- (xiii) **The Beta distribution:** 4.123 – 4.133 (pp 197 – 200)

Plus the Supplementary Exercises 4.160 – 4.169, 4.171 – 4.176 (pp 215 – 217)

3. Chapter 3.

- (i) **Transformations & Convolutions:** 6.1 – 6.20 (pp 307 – 310), 6.23 – 6.36 (pp 316 – 318).

See also Chapter 4 exercises.

4. Chapter 4.

- (i) **Multivariate distributions:** 5.1 – 5.18 (pp 232 – 235)
- (ii) **Marginal and conditional distributions:** 5.19 – 5.37 (pp 243 – 246)
- (iii) **Independence:** 5.43 – 5.64 (pp 251 – 254)
- (iv) **Multivariate expectations:** 5.72 – 5.85 (pp 261 – 264)
- (v) **Covariance and Correlation:** 5.89 – 5.101 (pp 268 – 270)
- (vi) **Sums of Random Variables:** 5.102 – 5.115 (pp 276 – 278)

Plus the Supplementary Exercises 5.144 – 5.158 (pp 291 – 292)

5. Chapter 5.

- (i) **Properties of the Sample Mean:** 7.9 – 7.20 (pp 364 – 366)
- (ii) **Chebychev's Theorem and Related Results:** 3.167 – 3.177 (pp 147 – 149), 4.146 – 4.150 (pp 209-210)
- (iii) **Central Limit Theorem and Approximation:** 7.42 – 7.57 (pp 374 – 376), 7.69 – 781 (pp 383 – 385)