Contents

riciu	CE	
CHA	PTER 1. AN INTRODUCTION TO NUMERICAL REASONING	:
1.1	Statistics—Some Definitions and Remarks	
1.2	Populations and Questions	;
1.3	Data Collection and Experiments	4
1.4	Random Variables	8
1.5	Types of Statistics	9
1.6	Notation	10
*1.7	History	10
1.8	Summary	2
1.9	References	2
1.10	Review Exercises	22
CHA	PTER 2. PROBABILITY AND SAMPLING	24
2.1	Introductory Remarks	24
2.2	Probability	25

Drofaco

2.3 Events

x CONTENTS

2.4		ry Events	33
2.5	General Rules of Probability		
2.6	•		
2.7	Counting	and Probability Examples	52
2.8	Sampling	g Techniques	61
2.9	Summar	y	70
2.10	Reference	es	71
2.11	Review 1	Exercises	72
СНА	PTER 3.	DESCRIPTIVE STATISTICS	74
3.1	A Look	Back, Then Ahead	74
3.2	Data-Co	llecting Situations	7 5
3.3	Data Pre	eparation and Presentation	77
3.4	Describi	ng Distributions	88
*3.5	Coding 1	Data by Linear Transformation	115
3.6	Misuses	of Statistics	117
3.7	Summa	У	119
3.8	Referen	ces	119
3.9	Review	Exercises	120
CH	APTER 4.	- · · · · · · · · · · · · · · · · · · ·	
		EMPIRICAL DATA	122
4.1	Introduc	tion	122
4.2		n Variables and Expected Values	124
4.3	Discrete	Uniform Models	130
4.4	Binomia	l Experiments and Models	136
*4.5	Multinor	nial Experiments and Models	148
*4.6	Hyperge	cometric Experiments and Models	158
*4.7	Poisson	Experiments and Models	167
4.8	Reference	ces	174
4.9	Review 1	Exercises	175
СНА	PTER 5.	CONTINUOUS PROBABILITY MODELS FOR	
		EMPIRICAL DATA	177
5.1	Introduct	ion and Definitions	177

181

5.2 Continuous Uniform Experiments and Models

CON.	TEN:	TS.
CON	1 1211	10

хi

*5.3	Triangular Models	188	
5.4			
5.5		193 218	
5.6	Summary	224	
5.7		224	
5.8	Review Exercises	225	
CHA	APTER 6. SAMPLING DISTRIBUTION RESULTS	228	
6.1	A Look Back, Then Ahead	228	
6.2	Sampling Distribution of \overline{X}	230	
6.3	Sampling Distribution of \$\hat{p}\$	249	
*6.4	Sampling Distribution of S ²	252	
6.5	Summary	260	
6.6	References	261	
6.7	Review Exercises	261	
СНА	PTER 7. ESTIMATION OF PARAMETERS	263	
7.1	Introduction to Statistical Inference	263	
7.2	Point Estimation	265	
7.3	An Introduction to Interval Estimation	279	
7.4	Confidence Intervals for Studying Normal Distributions	281	
7.5	Interval Estimation When Sampling	201	
	Binomial Distributions	308	
7.6	Summary of Estimation Techniques	311	
7.7	References	314	
7.8	Review Exercises	314	
СНА	PTER 8. TESTS OF STATISTICAL HYPOTHESES	316	
8.1	Introduction, Philosophy and Definitions	316	
8.2	Selection of Statistical Tests for	010	
	Uniform and Binomial Models	322	
8.3	Conclusions and a Look Ahead	340	
8.4	References	341	
8.5	Review Exercises	342	

xii CONTENTS

CHAP	TER 9. CHI-SQUARE TEST PROCEDURES	343
9.1	Introduction	343
9.2	Tests of Hypotheses for Binomial Models	344
9.3	Tests of Hypotheses for Multinomial Models	349
9.4	Contingency Tables	353
9.5	Goodness of Fit Procedures	361
9.6	Summary and a Word of Caution	376
9.7	References	377
9.8	Review Exercises	378
CHA	PTER 10. ONE-SAMPLE TESTING PROCEDURES FOR LOCATION AND DISPERSION	380
10.1	Introduction	380
10.2	•	381
*10.3		392
*10.4	Tests of H_0 : $\sigma^2 = \sigma^2_0$	395
10.5	-	397
10.6	References	398
10.7	Review Exercises	398
СНА	PTER 11. ANALYSIS OF VARIANCE AND OTHER TESTING PROCEDURES FOR TWO OR MORE SAMPLES	399
11.1	Introduction	399
11.2	Tests for Equal Locations	400
11.3	Tests for Equality of Location and Dispersion When Studying Two Samples	417
11.4	Outline of Testing Procedures	435
11.5	References	437
11.6	Review Exercises	438
СНА	PTER 12. SIMPLE LINEAR REGRESSION AND	
	CORRELATION	440
12.1	Introduction	440
12.2	Simple Linear Regression	442

OCHTENIO	And

551

12.	3 Correlation Analysis	464
12.4	4 Some Concluding Remarks	479
12.	5 References	480
12.	6 Review Exercises	480
APP	PENDICES	
A.	Algebraic Results with Mathematical Tables	482
B.	Tables for Use with Binomial Models	499
C.	Tables for Use with Poisson Models	517
D.	Tables for Use with Normal Models	522
E.	Tables of α -Level Values for Classical Statistical Procedures	532
F.	Tables of α -Level Values for Nonparametric Statistical Procedures	543

INDEX