

CONTENTS

Preface ix

Chapter 1: Basic Concepts 1

1-1 Real Numbers	1
1-2 Properties of Real Numbers	8
1-3 Inequalities	12
1-4 Absolute Value	19
1-5 Complex Numbers	24
Sample Test: Chapter 1	29

Chapter 2: Functions and Graphs 31

2-1 Defining Functions	31
2-2 Functional Notation	39
2-3 Operations with Functions	43
2-4 Variation	47
2-5 Graphs of Functions	52
2-6 Slope and Mathematical Change	69
Sample Test: Chapter 2	79

Chapter 3: Topics Concerning Polynomials 81

3-1	Linear Functions	81
3-2	Parallel and Perpendicular Lines	88
3-3	Systems of Linear Functions	92
3-4	Determinants	103
3-5	Quadratic Functions	109
3-6	Quadratic Formula	120
3-7	Quadratic Inequalities	128
3-8	Higher-Degree Polynomials	131
3-9	Rational Zeros of Polynomial Functions	136
3-10	Rational Functions	142
	Sample Test: Chapter 3	148

Chapter 4: Exponential and Logarithmic Functions 150

4-1	Review of Exponents	150
4-2	Exponential Functions	158
4-3	More Applications and the Number e	162
4-4	Inverse Functions	170
4-5	Logarithmic Functions	174
4-6	Properties of Logarithms	177
4-7	Logarithms to the Base 10	180
4-8	Logarithms to Bases Other Than 10	189
4-9	Graphs on Logarithmic Paper	191
	Sample Test: Chapter 4	197

Chapter 5: Trigonometric Functions of Real Numbers 199

5-1	Radians	199
5-2	Trigonometric Functions of Real Numbers	206
5-3	Evaluating Trigonometric Functions	216
5-4	Graphs of Sine and Cosine Functions	222
5-5	Graphs of the Other Trigonometric Functions	234
5-6	Trigonometric Equations	237
5-7	Inverse Trigonometric Functions	242
5-8	Trigonometric Identities	246
5-9	More on Trigonometric Identities	252
	Sample Test: Chapter 5	258

Chapter 6: Trigonometric Functions—A Different Viewpoint 260

6-1	Trigonometric Ratios	260
6-2	Trigonometric Functions of Acute Angles	267
6-3	Right Triangles	275
6-4	Vectors	287

6-5 Special Angles and Cofunctions	295
6-6 Reducing Functions of Angles in Any Quadrant	301
6-7 Law of Sines	308
6-8 Law of Cosines	317
6-9 Trigonometric Form of Complex Numbers	323
6-10 Products, Quotients, Powers, and Roots of Complex Numbers	327
Sample Test: Chapter 6	331

Chapter 7: Sequences and Series 333

7-1 Sequences	333
7-2 Series	340
7-3 Infinite Geometric Series	347
7-4 Binomial Theorem	350
7-5 Mathematical Induction	353
Sample Test: Chapter 7	355

Chapter 8: Conic Sections 356

8-1 Introduction	356
8-2 The Circle	359
8-3 The Ellipse	362
8-4 The Hyperbola	369
8-5 The Parabola	376
8-6 Conic Sections	383
Sample Test: Chapter 8	385

Appendices

A-1 Approximate Numbers	389
A-2 Geometric Formulas	392
A-3 Trigonometric Identities	394

Tables

Table 1 Squares, Square Roots, and Prime Factors	398
Table 2 Exponential Functions	399
Table 3 Common Logarithms (Base 10)	400
Table 4 Natural Logarithms (Base e)	402
Table 5 Trigonometric Functions of Real Numbers	404
Table 6 Trigonometric Functions of Angles	407
Table 7 Pascal's Triangle	412

Answers to Odd-Numbered Problems 413

Index 451