

CONTENTS

<i>Preface</i>	xi
1 NUMBERS	1
1.1 Integers	1
1.2 Universe	2
1.3 Variable	2
1.4 Proposition	3
1.5 Open Sentence	3
1.6 Rational Numbers	4
1.7 Irrational Numbers	11
1.8 Complex Numbers	13
1.9 Absolute Value	14
1.10 Roots and Powers	15
1.11 Rules of Arithmetic	18
1.12 Zero	21

2	EQUATIONS AND INEQUALITIES	23
2.1	Identities and Equations	23
2.2	First-Degree Equations	24
2.3	Quadratic Equations	25
2.4	Inequalities	30
2.5	Inequalities with One Absolute-Value Term	34
2.6	Inequalities with Two Absolute-Value Terms (Optional)	37
3	FUNCTIONS	41
3.1	Functions and Graphs	41
3.2	Domain and Range	48
3.3	Rule	50
3.4	Algebra of Functions	54
3.5	Composite Functions	56
4	GRAPHS	60
4.1	Graph of a Function	60
4.2	Graphs of Equations and Inequalities	64
4.3	Lines	70
4.4	Simultaneous Linear Equations and Inequalities	74
4.5	The Distance Formula in the Plane	81
4.6	Circles	83
4.7	Conics	86
4.8	Linear Programming	100
5	POLYNOMIAL FUNCTIONS	108
5.1	Introduction and Definition	108
5.2	Zeros by Formula	111
5.3	Operations on Polynomials	113
5.4	General Procedure for Finding Zeros	118
5.5	Factoring Polynomials	124
5.6	Graphing Polynomial Functions	129
5.7	Approximating Zeros	135
6	EXPONENTIAL FUNCTIONS	139
6.1	A Simple Exponential Function	139
6.2	Exponential Functions	142

6.3	A Very Special Exponential Function	143
6.4	Applications	146

7 INVERSE FUNCTIONS 153

7.1	One-to-One Functions	153
7.2	Inverses	156
7.3	Finding and Graphing Inverses	158
7.4	Some Algebra with Functions	164

8 LOGARITHMS 166

8.1	The Log Function	166
8.2	Properties of Logarithms	170
8.3	Computing Logarithms	173
8.4	Applications of Logarithms	179

9 TRIGONOMETRIC FUNCTIONS 184

9.1	Trigonometry of Real Numbers	184
9.2	Arc Length	184
9.3	Sine, Cosine, and Tangent	187
9.4	Periodicity	189
9.5	Special Numbers	191
9.6	Graphs	194
9.7	Cosecant, Secant, and Cotangent	198
9.8	Addition Theorems	199
9.9	Identities	203
9.10	Trigonometric Equations	205
9.11	Inverse Trigonometric Functions	209
9.12	Trigonometry of Angles	211
9.13	Right Triangles	216

10 APPLICATIONS OF TRIGONOMETRY TO GRAPHING 219

10.1	Introduction	219
10.2	Polar Coordinates	220
10.3	Graphing Polar Equations	224
10.4	Polar Coordinates versus Rectangular Coordinates	228
10.5	Parametric Equations	233

11	GRAPHING IN SPACE	238
11.1	Locating Points	238
11.2	Distance and Spheres	242
11.3	Planes	248
11.4	Graphs of Cylinders and Curves	254
11.5	Cross Sections as a Tool in Graphing	260
	Appendix A Synthetic Division	263
	Appendix B Tables	266
	Answers to Odd-numbered Problems	276
	<i>Index</i>	309