



PreCalculus

J. Douglas Faires
Youngstown State University

James DeFranza
St. Lawrence University

THOMSON
—★—™
BROOKS/COLE

Australia • Canada • Mexico • Singapore • Spain
United Kingdom • United States

Contents

CHAPTER 1 FUNCTIONS 1

- 1.1 Introduction 2
- 1.2 The Real Line 3
- 1.3 The Coordinate Plane 13
- 1.4 Equations and Graphs 20
- 1.5 Using Technology to Graph Equations 26
- 1.6 Functions 33
- 1.7 Linear Functions 51
- 1.8 Quadratic Functions 59
- Review Exercises 71
- Exercises for Calculus 75
- Chapter Test 76

CHAPTER 2 NEW FUNCTIONS FROM OLD 79

- 2.1 Introduction 80
- 2.2 Other Common Functions 81
- 2.3 Arithmetic Combinations of Functions 88
- 2.4 Composition of Functions 96
- 2.5 Inverse Functions 106
- Review Exercises 115
- Exercises for Calculus 118
- Chapter Test 119

CHAPTER 3 ALGEBRAIC FUNCTIONS 121

- 3.1 Introduction 122
- 3.2 Polynomial Functions 123

3.3	Finding Factors and Zeros of Polynomials	136
3.4	Rational Functions	145
3.5	Other Algebraic Functions	159
3.6	Complex Roots of Polynomials	165
	Review Exercises	173
	Exercises for Calculus	176
	Chapter Test	178

CHAPTER 4 **TRIGONOMETRIC FUNCTIONS** **181**

4.1	Introduction	182
4.2	Measuring Angles	183
4.3	The Sine and Cosine Functions	189
4.4	Graphs of the Sine and Cosine Functions	201
4.5	Other Trigonometric Functions	212
4.6	Trigonometric Identities	220
4.7	Right-Triangle Trigonometry	232
4.8	Inverse Trigonometric Functions	239
4.9	Applications of Trigonometric Functions	248
	Review Exercises	262
	Exercises for Calculus	264
	Chapter Test	266

CHAPTER 5 **EXPONENTIAL AND LOGARITHM FUNCTIONS** **269**

5.1	Introduction	270
5.2	The Natural Exponential Function	272
5.3	Logarithm Functions	283
5.4	Exponential Growth and Decay	293
	Review Exercises	300
	Exercises for Calculus	301
	Chapter Test	302

**CHAPTER 6 CONIC SECTIONS, POLAR COORDINATES, AND
PARAMETRIC EQUATIONS 304**

- 6.1 Introduction 306
- 6.2 Parabolas 307
- 6.3 Ellipses 314
- 6.4 Hyperbolas 323
- 6.5 Polar Coordinates 330
- 6.6 Conic Sections in Polar Coordinates 342
- 6.7 Parametric Equations 348
- Review Exercises 354
- Exercises for Calculus 355
- Chapter Test 357

ANSWERS TO ODD EXERCISES 361

INDEX 423
