

Table of Contents

| | | | |
|---|-----------|--|-----------|
| <i>Part I Algebra</i> | 5 | 3.7 Proof of the Factor Theorem. | 31 |
| SECTION 1: BASIC PROPERTIES OF REAL NUMBERS | 5 | SECTIONS 3.1–3.7: Exercises. | 32 |
| SECTION 2: LINEAR AND QUADRATIC EQUATIONS | 8 | 3.8 Complex Numbers | 33 |
| 2.1 Linear Equations | 8 | 3.8.1 How Do We Add Complex Numbers? . . . | 34 |
| SECTION 2.1: EXERCISES | 11 | 3.8.2 How Do We Multiply Complex Numbers? | 34 |
| 2.2 Quadratic Equations. | 12 | 3.8.3 How Do We Divide Complex Numbers? | 35 |
| 2.2.1 Equations of the Form $x^2 - p = 0$ | 12 | SECTION 3.8: EXERCISES | 38 |
| 2.2.2 Equations of the Form $k(x + r)^2 - p = 0$, Where $k \neq 0$ | 12 | SECTION 4: FUNCTIONS. | 40 |
| 2.2.3 Equations of the Form $ax^2 + bx + c = 0$, Where $a \neq 0$ | 13 | 4.1 Preliminaries | 40 |
| 2.2.4 The Discriminant. | 15 | 4.2 Definition of a Function | 41 |
| SECTION 2.2: EXERCISES | 16 | 4.3 Many-to-One Functions Versus One-to-One Functions | 44 |
| SECTION 3: POLYNOMIAL EQUATIONS. | 18 | 4.4 Inverse Functions | 45 |
| 3.1 When Are Two Polynomials Equal? . . . | 19 | SECTION 4: EXERCISES. | 49 |
| 3.2 How Do We Add and Subtract Polynomials? | 19 | SECTION 5: GRAPHING | 50 |
| 3.3 How Do We Multiply Polynomials? . . . | 20 | 5.1 What Does the Graph of a Linear Function $y = ax + b$ Look Like? | 50 |
| 3.4 How Do We Divide Polynomials? | 21 | 5.2 What Does the Graph of a Quadratic Function $y = ax^2 + bx + c$ Look Like? | 52 |
| 3.5 How Does the Division of Polynomials Help Us with Polynomial Equations? | 25 | 5.2.1 The Case $y = x^2$ | 52 |
| 3.6 Proof of the Rational Root Theorem . . . | 30 | 5.2.2 The General Case $y = ax^2 + bx + c$ | 54 |
| | | 5.3 What Do the Graphs of Some Polynomials Look Like? | 57 |
