

Contents

<i>Preface</i>	v
1. Prologue	1
1.1 An Example	1
1.2 Basic Definitions	3
2. Envelopes and Dual Sets	9
2.1 Plane Curves	9
2.2 Envelopes	12
2.3 Dual Sets of Plane Curves	16
2.4 Notes	18
3. Dual Sets of Convex-Concave Functions	19
3.1 Quasi-Tangent Lines	19
3.2 Asymptotes	21
3.3 Intersections of Quasi-Tangent Lines and Vertical Lines	23
3.4 Distribution Maps for Dual Points	30
3.5 Intersections of Dual Sets of Order 0	47
3.6 Notes	50
4. Quasi-Polynomials	51
4.1 Δ - and ∇ -Polynomials	51
4.2 Characteristic Regions	56
4.3 Notes	60
5. $\mathbf{C} \setminus (0, \infty)$ -Characteristic Regions of Real Polynomials	61
5.1 Quadratic Polynomials	61
5.2 Cubic Polynomials	63
5.3 Quartic Polynomials	64
5.3.1 First Description	65

5.3.2	Second Description	72
5.4	Quintic Polynomials	77
5.5	Notes	83
6.	$\mathbf{C} \setminus (0, \infty)$ -Characteristic Regions of Real Δ -Polynomials	85
6.1	Δ -Polynomials Involving One Power	85
6.1.1	$\Delta(1, 0)$ -Polynomials	85
6.1.2	$\Delta(0, 1)$ -Polynomials	87
6.1.3	$\Delta(1, 1)$ -Polynomials	89
6.2	Δ -Polynomials Involving Two Powers	92
6.2.1	$\Delta(0, 0, 0)$ -Polynomials	92
6.2.2	$\Delta(1, 0, 0)$ -Polynomials	95
6.2.3	$\Delta(1, 1, 0)$ -Polynomials I	101
6.2.4	$\Delta(1, 1, 0)$ -Polynomials II	109
6.2.5	$\Delta(n, n, 0)$ -Polynomials	119
6.3	Δ -Polynomials Involving Three Powers	140
6.3.1	The Case $0 < \tau < \sigma < \delta$	142
6.3.2	The Case $\tau < \sigma < \delta < -1$	152
6.4	Notes	155
7.	$\mathbf{C} \setminus \mathbf{R}$ -Characteristic Regions of ∇ -Polynomials	157
7.1	∇ -Polynomials Involving One Power	157
7.1.1	$\nabla(0, 0)$ -Polynomials	157
7.1.2	$\nabla(1, 0)$ -Polynomials	158
7.1.3	$\nabla(0, 1)$ -Polynomials	159
7.1.4	$\nabla(1, 1)$ -Polynomials	159
7.1.5	$\nabla(n, n)$ -Polynomials	161
7.2	∇ -Polynomials Involving Two Powers	169
7.2.1	$\nabla(0, 0, 0)$ -Polynomials	169
7.2.2	$\nabla(1, 0, 0)$ -Polynomials	172
7.2.3	$\nabla(1, 1, 0)$ -Polynomials	176
7.2.4	$\nabla(n, n, 0)$ -Polynomials	186
7.3	∇ -Polynomials Involving Three Powers	197
7.3.1	$\nabla(0, 0, 0, 0)$ -Polynomials	197
7.3.2	$\nabla(1, 0, 0, 0)$ -Polynomials	200
7.4	Notes	206
Appendix A	Intersections of Dual Sets of Order 0	207
A.1	Intersections of Dual Sets of Order 0	207
	<i>Bibliography</i>	225
	<i>Index</i>	227