
Contents

Heights, Transcendence, and Linear Independence on Commutative Group Varieties	
<i>David Masser</i>	1
1 First lecture. Introduction and basic techniques	1
2 Second lecture. More on heights	8
3 Third lecture. Elliptic functions and elliptic curves.....	17
4 Fourth lecture. Linear forms in elliptic logarithms	24
5 Fifth lecture. Abelian varieties	32
6 Sixth Lecture. Commutative group varieties	39
References	47
Linear Forms in Logarithms of Rational Numbers	
<i>Yuri Nesterenko</i>	53
1 Introduction	53
2 Main result and induction assumption	54
3 Construction of auxiliary function	59
3.1 Binomial polynomial	59
3.2 Siegel's lemma with weights	62
3.3 Some topics from the geometry of numbers.....	66
3.4 Upper bound for an index	69
3.5 Construction	71
4 Extrapolation of zeros	79
4.1 Interpolation formula.....	81
4.2 Extrapolation of zeros in \mathbb{Q}	83
4.3 Extrapolation with Kummer descent	90
5 Zero estimates and the end of the proof of Theorem 2.1	95
5.1 Zero estimates on linear algebraic groups	97
5.2 Construction of the sublattice Φ from Proposition 2.6	98
References	106

Approximation of Algebraic Numbers	
<i>Hans Peter Schlickewei</i>	107
1 Results	107
2 Roth's proof of theorem 1.1	112
2.1 Vanishing	113
2.2 Non-Vanishing	116
2.3 Conclusion	117
3 Schmidt's proof of theorem 1.2	118
3.1 Parallelepipeds	118
3.2 The approximation part	120
3.3 The geometry part	127
4 The proof of theorem 1.3	130
4.1 Parallelepipeds	131
4.2 The approximation part	135
4.3 The geometry part	137
5 Generalization of theorem 1.4	144
5.1 Parallelepipeds	146
5.2 The approximation part	150
6 Gap principles	161
6.1 Vanishing determinants	161
6.2 Application of Minkowski's Theorem	166
References	170
Linear Recurrence Sequences	
<i>Wolfgang M. Schmidt</i>	171
1 Introduction	171
2 Functions of Polynomial-Exponential Type	173
3 Generating Functions	179
4 Factorization of Polynomial-Exponential Functions	180
5 Gourin's Theorem	185
6 Hadamard Products, Quotients and Roots	190
7 The Zero-Multiplicity, and Polynomial-Exponential Equations	192
8 Proof of Laurent's Theorem in the Number Field Case	195
9 A Specialization Argument	200
10 A Method of Zannier Using Derivations	202
11 Applications to Linear Recurrences	207
12 Bounds for the Number of Solutions of Polynomial-Exponential Equations	213
13 The Bavencoffe-Bézivin Sequence	218
14 Proof of Evertse's Theorem on Roots of Unity	223
15 Reductions for Theorem 12.3	226
16 Special Solutions	229
17 Properties of Special Solutions	231
18 Large Solutions	234
19 Small Solutions, and the end of the proof of Theorem 12.3	235

20	Linear Recurrence Sequences Again	236
21	Final Remarks	243
	References	245
Linear Independence Measures for Logarithms of Algebraic Numbers		
	<i>Michel Waldschmidt</i>	249
1	First Lecture. Introduction to Transcendence Proofs	252
1.1	Sketch of Proof	252
1.2	Tools for the Auxiliary Function	253
1.3	Proof with an Auxiliary Function and without Zero Estimate	255
1.4	Tools for the Interpolation Determinant Method	260
1.5	Proof with an Interpolation Determinant and a Zero Estimate	261
1.6	Remarks	262
2	Second Lecture. Extrapolation with Interpolation Determinants	267
2.1	Upper Bound for a Determinant in a Single Variable	267
2.2	Proof of Hermite-Lindemann's Theorem with an Interpolation Determinant and without Zero Estimate	273
3	Third Lecture. Linear Independence of Logarithms of Algebraic Numbers	277
3.1	Introduction to Baker's Method	278
3.2	Proof of Baker's Theorem	283
3.3	Further Extrapolation with the Auxiliary Function	289
3.4	Upper Bound for a Determinant in Several Variables	291
3.5	Extrapolation with an Interpolation Determinant	297
4	Fourth Lecture. Introduction to Diophantine Approximation	300
4.1	On a Conjecture of Mahler	300
4.2	Fel'dman's Polynomials	306
4.3	Output of the Transcendence Argument	307
4.4	From Polynomial Approximation to Algebraic Approximation	312
4.5	Proof of Theorem 4.2	315
5	Fifth Lecture. Measures of Linear Independence of Logarithms of Algebraic Numbers	316
5.1	Introduction	316
5.2	Baker's Method with an Auxiliary Function	318
6	Sixth Lecture. Matveev's Theorem with Interpolation Determinants	336
6.1	First Extrapolation	337
6.2	Using Kummer's Condition	338
6.3	Second Extrapolation	340
6.4	An Approximate Schwarz Lemma for Interpolation Determinants	341
	References	342