

Contents

	page	
Preface	vii	
Prologue	xi	
Chapter 1	SKEW POLYNOMIAL RINGS AND THEIR FIELDS OF FRACTIONS	1
1.1	The general embedding problem	1
1.2	Ore's method	6
1.3	Skew polynomial rings	9
Chapter 2	TOPOLOGICAL METHODS	17
2.1	Power series rings	17
2.2	Inverse limits of Ore domains	28
Chapter 3	EXTENSIONS OF FINITE DEGREE	30
3.1	Generalities	30
3.2	The Sweedler predual and the Jacobson-Bourbaki correspondence	32
3.3	Galois theory	40
3.4	Pseudo-linear extensions	55
3.5	Cyclic outer Galois extensions	65
Chapter 4	THE GENERAL EMBEDDING	73
4.1	The category of epic R-fields and specializations	73
4.2	The construction of epic R-fields	77
4.3	Firs and semifirs	86
Chapter 5	COPRODUCTS OF FIELDS	92
5.1	The coproduct construction for groups and rings	92

5.2	Projective modules over coproducts over skew fields	98
5.3	The monoid of projectives	103
5.4	The tensor K-ring on a bimodule	111
5.5	Subfields of field coproducts	114
5.6	Extensions with different left and right degrees	123
Chapter 6	GENERAL SKEW FIELD EXTENSIONS	127
6.1	Presentations of skew fields	127
6.2	Existentially closed skew fields	130
6.3	A specialization lemma	141
6.4	The word problem for free fields	149
6.5	A skew field with unsolvable word problem	158
Chapter 7	RATIONAL RELATIONS AND RATIONAL IDENTITIES	162
7.1	Polynomial identities	162
7.2	Rational identities	165
7.3	Specializations	172
7.4	A special type of rational identity	175
7.5	The rational meet of a family of X-rings	178
7.6	The support relation	187
7.7	Examples	193
Chapter 8	EQUATIONS AND SINGULARITIES	199
8.1	Equations over skew fields	199
8.2	Left and right eigenvalues of a matrix	205
8.3	Canonical forms for a single matrix over a skew field	210
8.4	Special cases of the singular eigenvalue problem	217
8.5	Specializations and the rational topology	223
8.6	Algebraic dependence	230
List of notations		232
Bibliography		234
Index		251