

Table of Contents

Introduction	xi
1. The Sixteenth and Early Seventeenth Centuries	1
1.1. Introduction	1
1.2. Napier and Logarithms	2
1.3. Briggs and His Logarithms	13
1.4. Bürgi and His Antilogarithms	20
1.5. Interpolation	23
1.6. Vieta and Briggs	33
1.7. Kepler	41
2. The Age of Newton	51
2.1. Introduction	51
2.2. Logarithms and Finite Differences	54
2.3. Trigonometric Tables	62
2.4. The Newton–Raphson and Other Iterative Methods	64
2.5. Finite Differences and Interpolation	68
2.6. Maclaurin on the Euler–Maclaurin Formula	84
2.7. Stirling	97
2.8. Leibniz	117
3. Euler and Lagrange	119
3.1. Introduction	119
3.2. Summation of Series	124
3.3. Euler on the Euler–Maclaurin Formula	126
3.4. Applications of the Summation Formula	129
3.5. Euler on Interpolation	137
3.6. Lunar Theory	142
3.7. Lagrange on Difference Equations	145
3.8. Lagrange on Functional Equations	149
3.9. Lagrange on Fourier Series	154
3.10. Lagrange on Partial Difference Equations	158
3.11. Lagrange on Finite Differences and Interpolation	161
3.12. Lagrange on Hidden Periodicities	171
3.13. Lagrange on Trigonometric Interpolation	182

4. Laplace, Legendre, and Gauss	185
4.1. Introduction	185
4.2. Laplace on Interpolation	185
4.3. Laplace on Finite Differences	191
4.4. Laplace Summation Formula	192
4.5. Laplace on Functional Equations	195
4.6. Laplace on Finite Sums and Integrals	198
4.7. Laplace on Difference Equations	203
4.8. Laplace Transforms	206
4.9. Method of Least Squares	209
4.10. Gauss on Least Squares	212
4.11. Gauss on Numerical Integration	224
4.12. Gauss on Interpolation	233
4.13. Gauss on Rounding Errors	258
5. Other Nineteenth Century Figures	261
5.1. Introduction	261
5.2. Jacobi on Numerical Integration	261
5.3. Jacobi on the Euler-Maclaurin Formula	266
5.4. Jacobi on Linear Equations	270
5.5. Cauchy on Interpolation	276
5.6. Cauchy on the Newton-Raphson Method	278
5.7. Cauchy on Operational Methods	280
5.8. Other Nineteenth Century Results	284
5.9. Integration of Differential Equations	285
5.10. Successive Approximation Methods	294
5.11. Hermite	298
5.12. Sums	309
Bibliography	316
Index	337