

1 Errors, Condition and Instability Obsah

1 Errors, Condition and Instability	2
1.1 Errors	2
1.2 Condition	2
1.3 Instability	2
2 Solution of Nonlinear Equations	4
2.1 Separation of the Roots	4
2.2 Bisection Method	5
2.3 Regula falsi Method	6
2.4 Fixed point Iteration	7
2.5 Newton's Method	10
3 Polynomial Interpolation	12
3.1 Interpolation Problem	12
3.2 Interpolating Polynomial	12
3.3 Lagrange Interpolation Polynomial	13
3.4 Aitken's Algorithm	14
4 Systems of Linear Equations	16
4.1 Eigenvalues, Matrix Norms and Condition Number	16
4.2 Iterative Techniques	17
5 Systems of Nonlinear Equations	19
5.1 Newton's Method Spread to Systems of n Equations in n Unknowns	19
5.2 Applying the Method of Iterations to Systems of n Equations in n Unknowns	20
6 Numerical Quadrature	22
6.1 The Integration Formulas of Newton and Cotes	22
6.2 Trapezoidal method	23
6.3 Simpson's method	24
6.3 Double computation	25
6.4 The Monte Carlo method	26
7 Approximation of functions	27
7.1 Introduction	27
7.2 The Method of Least Squares	27
8 Statistics	29
8.1 Introduction	29
8.2 Probability Distributions	29
8.3 Measures of Central Tendency	32
8.4 Variance and Standard Deviation	33
8.5 Continuous random variables	34
8.6 The Normal Distribution	36
Literature	39

The larger the condition, the more ill-conditioned the function is said to be.

1.3 Instability

The related notion of instability describes the sensitivity of a numerical process for the calculation of $f(x)$ from x to the inevitable rounding errors committed during its