

Numerical Methods Cheat Sheet

1 Root Finding

1.1 Bisection Method

1.2 Newton's Method

1.3 Secant Method

1.4 Fixed Point Iteration

2 Interpolation

2.1 Lagrange Interpolation

2.2 Newton Divided Differences

2.3 Error Bound

3 Numerical Integration

3.1 Trapezoidal Rule

3.2 Simpson's Rule

3.3 Gaussian Quadrature

4 Linear Systems

4.1 Gaussian Elimination

4.2 LU Decomposition

4.3 Iterative Methods

4.4 Condition Number

5 Ordinary Differential Equations

5.1 Euler's Method

5.2 Runge-Kutta (RK4)

5.3 Stability

6 Error Analysis

6.1 Types of Error

6.2 Order of Convergence

7 Useful Formulas

7.1 Taylor Series

7.2 Finite Differences