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## Mathematical Background

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- 2.8: Mean Value Theorem
- 2.22: Taylor Series
- 2.32: Differentiation
- 2.34: Differentiation
- 2.36: Differentiation

## Solving Nonlinear Equations

- 3.2
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  - b: Secant Method
  - c: Newton Method
- 3.8: Newton Method
- 3.14
  - a: Newton Method
  - b: Fixed-Point Iteration Method
- 3.26: Newton Method
- 3.27: Using Matlab Functions

## Solving a System of Linear Equations

- 4.2: Gauss Elimination Method
- 4.13: Gauss-Jordan Method
- 4.19: 1-norm
- 4.25: 1-norm
- 4.34: Gaussian Elimination Method

## Eigenvalues and Eigenvectors

- 5.3: Characteristic Equation
- 5.7: Power Method
- 5.9: Inverse Power Method
- 5.10: Power Method
- 5.12: QR Factorisation
- 5.18: Using Matlab Functions

## Curve Fitting and Interpolation

- 6.3: Least-Squares Regression
- 6.8: Linear Regression
- 6.13: Lagrange
- 6.21: Nonlinear Equations
- 6.31: Nonlinear Equations
- 6.41: Nonlinear Equations

## Numerical Differentiation

- 8.3
  - a: Two-point backward difference formula
  - b: Three-point backward difference formula
  - c: Two-point central difference formula
- 8.8: Order of truncation or Discretion Error
- 8.9:
  - a: Three-point backward difference formula
  - b: Three-point central difference formula
- 8.19: Matlab

- 8.31: Using Matlab Functions
- 8.37: Using Matlab Functions

## Numerical Integration

- 9.1:
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  - b: Composite Trapezoidal Method
  - c: Composite Simpson's  $3/8$  Method
- 9.5:
  - a: Composite Trapezoidal Method
  - b: Composite Simpson's  $1/3$  Method
  - c: Composite Simpson's  $3/8$  Method
- 9.7:
  - a: Simpson's  $1/3$
  - b: Simpson's  $3/8$
- 9.10:
  - a: Simpson's  $1/3$
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  - c: Three-point Gauss Quadrature
- 9.23: Simpson's  $3/8$
- 9.26: Gauss Error Function
- 9.30: Using Matlab Functions
- 9.35: Using Matlab Functions