

1132_數值方法 Numerical Method

HW4

Use Matlab

Q1

Exact Integral Value: 0.385936

a. Composite Trapezoidal Rule Result: 0.396148

b. Composite Simpson's Rule Result: 0.385664

c. Composite Midpoint Rule Result: 0.364696

Q2

Exact Integral Value: 0.192259

Gaussian Quadrature with n = 3: 0.192259

Absolute Error = 0.000000, Relative Error = 0.0000%

Gaussian Quadrature with n = 4: 0.192259

Absolute Error = 0.000000, Relative Error = 0.0000%

Q3

Exact Value = 0.511845

a. Simpson's Rule = 0.511853

b. Gaussian Quadrature = 0.511866

c. Simpson's Rule Absolute Error = 0.000009, Relative Error = 0.0017%

Gaussian Quadrature Absolute Error = 0.000021, Relative Error = 0.0041%

Q4

(a) Approximate value of $\int x^{-1/4} * \sin(x) dx$ from 0 to 1: 0.5284086

(b) Approximate value of $\int x^{-4} * \sin(x) dx$ from 1 to ∞ : 0.2900903