

Assignment 11. Gaussian quadrature

Marks 10

Posted on 16.10.2025 @ 2:30 pm and due on 16.10.2025 @ 6:00 pm

1. Use appropriate n -point Gaussian quadrature to evaluate

$$\int_{-1}^1 \frac{x^2}{1+x^4} x \approx 1.110\,720\,735$$

accurate up to 9 places in decimal.

2. Use Simpson's rule and appropriate Gaussian quadrature to evaluate the following integral accurate up to 9 places in decimal

$$\int_0^1 \sqrt{1+x^4} dx \approx 1.089\,429\,413$$

Roots and weights of Legendre polynomials for various orders are given in the accompanying attachment.