Assignment 11. Gaussian quadrature Marks 10

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

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1. Use appropriate n-point Gaussian quadrature to evaluate

$$\int_{-1}^{1} \frac{x^2}{1+x^4}\,dx \;\approx\; 0.487\,495\,494$$

   accurate up to 8 or 9 places in decimal.

2. Use Simpson's rule and appropriate Gaussian quadrature to evaluate the following integral accurate up to 8 or 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 accomapnying attachment.