

Quiz 06

Dec 31, 2010.

1. Find constants a , b , c and d so that the quadrature $\int_{-1}^1 f(x)dx = af(-1) + bf(1) + cf'(-1) + df'(1)$ reaches maximal degree of precision.
2. Derive Gaussian quadrature for $\int_{-1}^1 f(x)dx$ for the case $n = 2$ (two nodes).
3. Find order of convergence of Midpoint rule applied directly (no subtraction of singular part, change of variable, etc) to the integral $\int_0^1 x^{-\frac{1}{3}} dx$. You can find the order either numerically or analytically. Give details.
4. Find 10 correct digits of $\int_0^1 \frac{e^x}{\sqrt{x}} dx$.
5. Estimate number of multiplications/divisions needed for the elimination part of Gauss elimination for an $n \times n$ matrix. Give leading order with correct coefficient (i.e. Cn^p , find C and p).

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