LABORATORY ASSIGNMENT

1. Assume a continuous function $f(x): R \supset [a,b] \to R$, such that $I = \int_a^b f(x)dx$ is a proper integral. Use selected, composite Newton-Cotes and Gauss-Legendre quadratures with n subintervals to approximate I. Estimate the error of the approximation.

2. Calculate numerically the first and the second derivatives of the given function $f(x) = 1/(1 + x^2)$ in the range [0, 5], for $x_i = i \cdot 0.5$, $i = 0$, 1..10. Compare with the exact solution.