Computational Physics Assignment 6: Interpolation

Consider function

$$f(x) = \frac{1}{1 + 25x^2} \tag{1}$$

in the interval between $x = -1$ and $x = 1$.

(**a**) Write a code to generate and plot Lagrange interpolating polynomials up to order 8 using the values of function (1) corresponding to points

$$x = -1,\ -0.75,\ -0.5,\ -0.25,\ 0,\ 0.25,\ 0.5,\ 0.75,\ 1. \tag{2}$$

(**b**) Generate cubic splines using the values of the function (1) at points (2). Make a plot of the resulting interpolating function.

(**c**) Estimate the error of the interpolating polynomials and the cubic splines. Which method gives the most accurate result?