Dr. Stefan Schnabel SoSe 2019

Numerical Methods
Homework 8

Due: Wednesday, June 5th, 11:00am
or per email on Tuesday to **cpopov59@gmail.com**

1. **Interpolation**

   Find the polynomial that interpolates the points $(-\pi, 0)$, $(-\frac{\pi}{2}, -1)$, $(0, 0)$, $(\frac{\pi}{2}, 1)$ and $(\pi, 0)$. Compare the coefficients of the solution with the forth-order Taylor expansion of $\sin(x)$ around $x_0 = 0$. Plot both polynomials and $\sin(x)$ in one diagram.

2. **Deflation-Inflation**

   Write a program that stores the coefficients of a polynomial of nth order in an array or vector and provide functions to divide/multiply this polynomial by a linear term $(x - x_0)$ where x_0 is a constant. (*Ignore any reminder that results from the divison.*) The obtained coefficients of the deflated/inflated polynomial should be stored in a different array/vector.