Numerical Analysis
Homework 6

1. List the Chebyshev interpolation nodes $x_1, ..., x_n$ in the given interval $[-1, 1], n = 6$ and find the upper bound for $|(x - x_1)...(x - x_n)|$ on this interval.

2. Let $T_n(x)$ denote the degree n Chebyshev polynomial. Find a formula for $T_n(0)$.

3. Determine the following values

   (a) $T_{999}(-1)$

   (b) $T_{1000}(-1)$

   (c) $T_{999}(0)$

   (d) $T_{1000}(0)$

4. Determine the Pade approximations with $k = l = 3$ for $f(x) = sinx$. Compare the results at $x_i = 0.1i$, for $i = 0, 1, ..., 5$, with the exact results of the sixth Maclaurin polynomial.