

Home work 7: Due Thurs. March. 24, 2016 Math 2335 Spring 2016

Name: _____

(1) (a) Consider finding the polynomial interpolation $P_3(x)$ for $f(x) = e^{-x^2}$ over the interval $[-1, 1]$. If the optimal nodes are used in order to reduce the error, find a bound on the error

$$|\text{Err}(P_3(x))| = |f(x) - P_3(x)|$$

(b) Suppose instead that f is to be interpolated by P_3 over the interval $[0, 1]$. Bound the error $|f(x) - P_3(x)|$ in this case. (Again assume that the optimal, now shifted, nodes are used.)

(2) Consider the data points $\{(0, 2), (1, 1), (2, -1)\}$.

(a) Find the piecewise linear interpolating function for the data, and

(b) the natural cubic spline that interpolates the data.

Your answer should be presented **clearly** as piecewise defined functions in simplified form.