

MAE384 Fall 2009 Homework #3

1. The set of the following 4 data points is given:

x	y
-2	0.58
0	1.8
3	1.23
5	2.05

(a) Perform interpolation by first determining the 3rd order polynomial that passes through the points, using Lagrange interpolation method. Provide the detail of the four Lagrange functions used in the intermediate steps. Use the result to determine the value of y at $x = 4$. **(2.5 points)**

(b) Make the following two plots for (i) The original data points and the 3rd order polynomial obtained in (a) (together, in a single plot), (ii) The four Lagrange functions used in (a). **(0.5 point)**

2. The set of the following 4 data points is given:

x	y
1	3.9
2	2.2
4	2.0
6	3.0

(a) Following the procedure in Sec. 5.6.2 in the textbook, determine the quadratic splines that fit the data. Show your procedure. (You may use the `a\b` command of Matlab, or other means as you prefer, to solve the matrix problem.) **(3.5 points)**

(b) Plot the quadratic splines obtained in (a) and the original data points in a single figure, in the fashion of the figure in Example 5-7 in the textbook. **(0.5 point)**