***MATLAB* Exploration III** **MA 377/MA 577 Fall 2018**
Due at the beginning of class on Wednesday, October 17, 2018 [20 points]

Use *MATLA*B to Explore Lagrange Polynomials

ASSIGNMENT:
The goal is to investigate Lagrange Polynomials, $P_n(x)$.

(a.) Via graphs of Lagrange polynomials [See for example Figure 3.5 on page 108.] explore the behavior of Lagrange Polynomials. Describe the observed behaviors. A suggestion: Using the data set $\{x_i = i\}_{i=0}^{9}$ compare the graphical images of $L_{9,k}(x)$ for $k = 0, 1, 2, \ldots, 9$. Describe/comment on the behaviors and properties you observe.

(b.) For pp112-13, #6(a.) and #8(a.), using graphs of $f(x)$ and $P_n(x)$, for $n = 1, 2, 3$, compare the effectiveness of the $P_i(x)$ to approximate $f(x)$. Submit copies of three sets of graphs: $f(x)$ and $P_i(x)$, $i = 1, 2, 3$ along with your comments about each set of graphs.

BONUS
[5 points] 1. Using the function in 8(a.) repeat (b.) for Taylor Polynomials, $T_i(x)$, $i = 1, 2, 3$ about $x = 0.43$.
[3points] 2. Carefully compare the graphical results for Lagrange Polynomials vs Taylor Polynomials for their effectiveness at approximating $f(x)$.

Hand-in a hardcopy or send a digital copy to weiss@fairfield.edu of your solution by the beginning of class on **Wednesday, October 17, 2018**.
Your solution should include:

1. A copy of your *MATLAB* code(s) and output(s);
2. A report (your comments) about your results.