AMSC/CMSC460 Section 2.

Homework Set 1. Due: Tu March 1, 2011. 10:45am
By the end of the class

1.
a) Obtain a polynomial of least degree that satisfies
$(x_n, y_n)=(0,7), (2,11), (3,28), (4, 63)$
[Hint: Use the Lagrange form]

b) Use the same data as above and obtain the Newton representation.

2.
a) Show that the polynomials
$p(x)=3+2(x-1)+4(x-1)(x+2)$
$q(x)=4x^2+6x-7$
are both interpolating polynomials for
~~$(x_n, y_n)=(1,3), (-2,-7), (0, 7).$~~
$(x_n, y_n)=(1,3), (-2,-3), (0, -7).$

b) Discuss uniqueness of the polynomial interpolation for p(x) and q(x).

3.
a) Write a MATLAB code that interpolates exp(x) by a polynomial of 10-degree polynomial on [0,2] and obtain the coefficients using
- Vandermonde approach
- Newton representation
- Lagrange form

[Include the MATLAB Codes]

b) Compare the results with the actual exp(x) using 100 data points over the integral and plot the results.