Homework 4
CS 323 - Numerical Analysis

1. Given the points (1,0.7),(2,0.73),(3,0.8),(4,0.75),(5,0.6). Use Lagrange polynomials to find the polynomial that goes through all the points.

2. Complete the following table

x	1.0	1.3	1.6	1.9	2.2
y	0.7651977	0.6200860	0.4554022	0.2818186	0.1103623

   Assuming $x = 1.5$, Using Neville's Method.

3.

x	0.6283185308	1.2566370616	1.8849555924	2.5132741232
y	0.587785252358846		0.951056516219097	0.587785252026982

   (a) Complete the divided differences table

   (b) Find the approximation polynomial

   (c) Evaluate the polynomial in $x = 1.5$

4. Let $f(x) = x^4 + \sqrt{2}x^3 + \pi x$. Verify whether $f[1, 2, 3, 4] = f[0, 1, \pi, e, -1]$

5. Find the equations that are needed to find a quadratic spline $S_i(x) = a_i + b_i(x - x_i) + c_i(x - x_i)^2$. In this case you will not need a condition on the second derivative. HINT: from the condition on the first derivative find c_i and substitute in the other equation to find a system of equations for the b_i's.