Prelab:

Solving for A:

I would invert the Vandermonde matrix, being left with the equation: $A = V^{-1}b$. V contains information about each of the interpolation points it seems (each row has a different x-value). So, if you solve for A, it seems like you have solved p at each of the interpolation points.

Summary of the remainder of the lab:

We're creating the interpolation of a function using a function for each interpolation point using the methods: monomial expansion, Lagrange polynomials, Newton divided differences. We will study the error in the approximation of each method.

Next, we're improving the approximation by controlling what we can control: (x-x0)...(x-xn) by adding more nodes near the end of the interval. Using this, we will repeat the previous methods used and see the new error.

Lab:

I did the monomial expansion version. I had N = 10 interpolation nodes with 1000 evaluation points. The plot looks like the approximation does approximate the polynomial within a certain domain. However, I found that the absolute error is really large (in the thousands). I didn't have time to debug this.