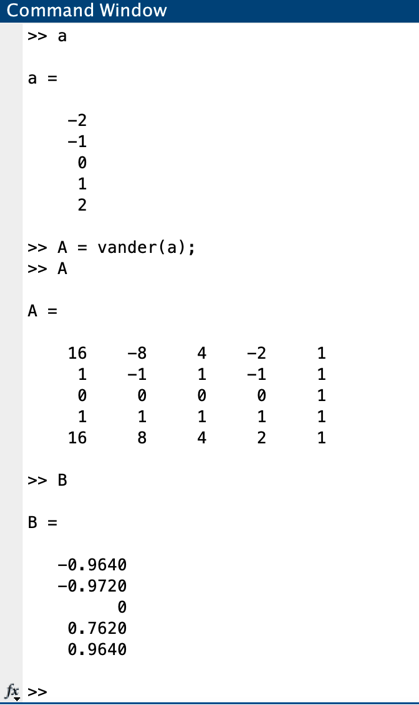
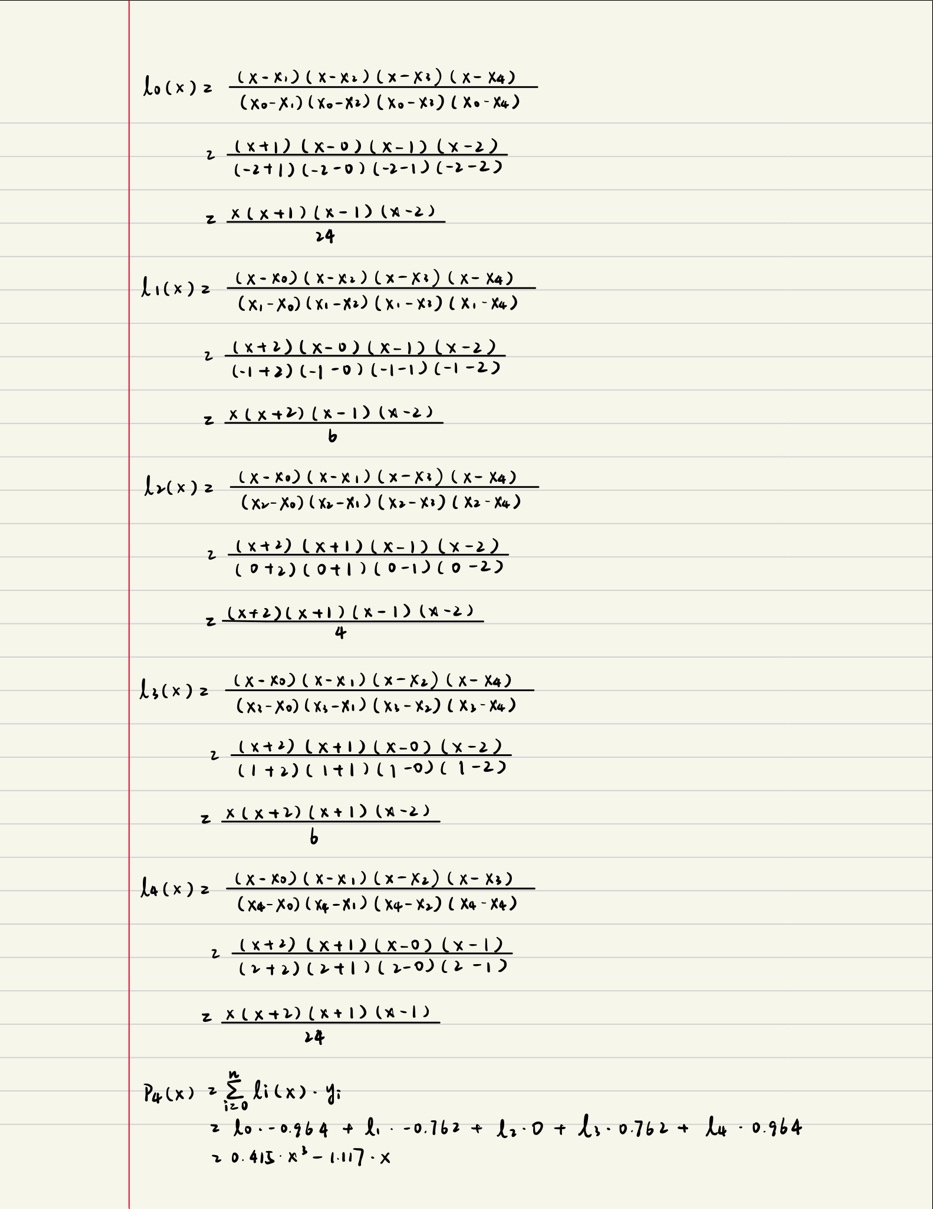
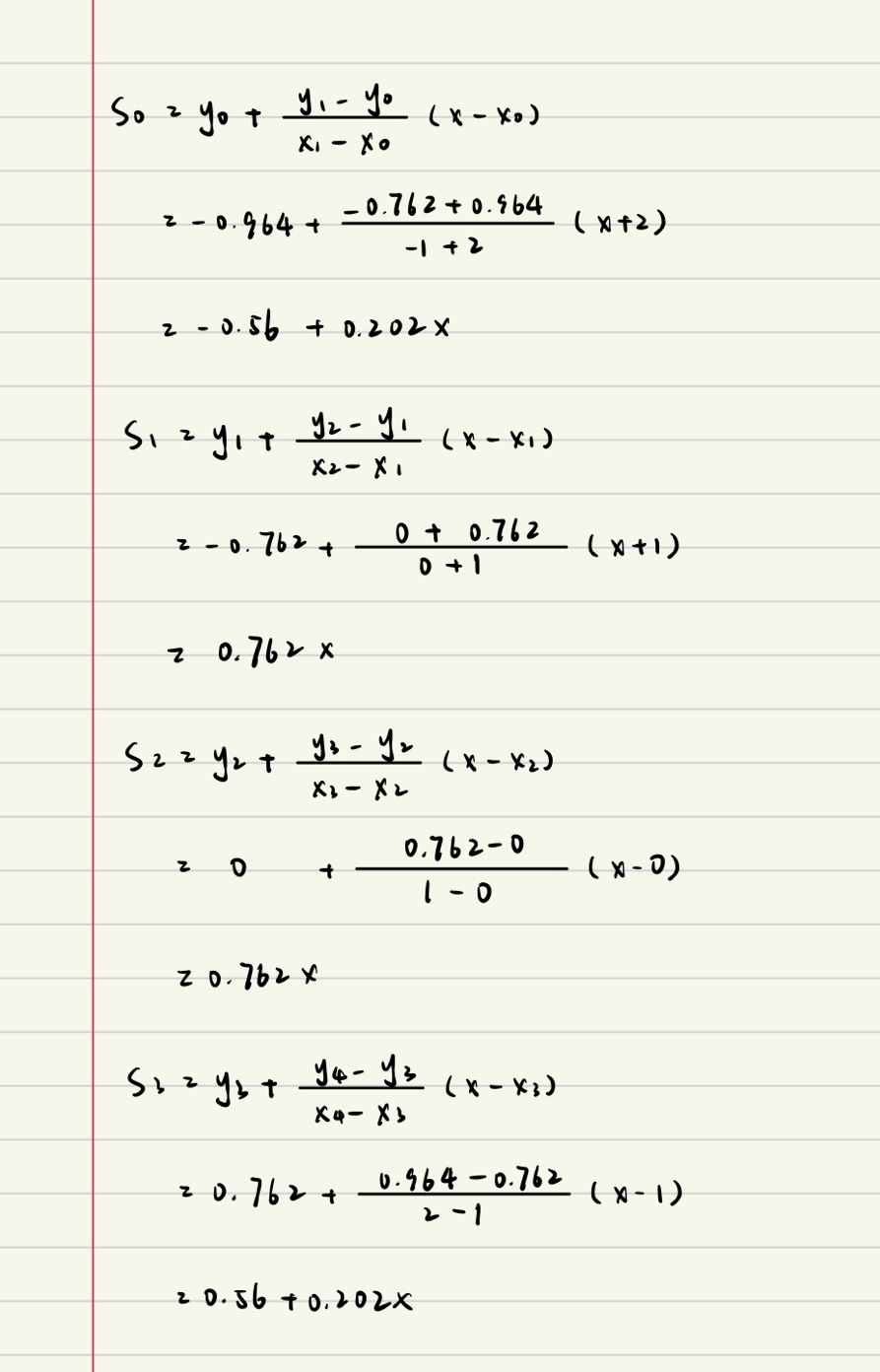
**CS 323 Homework 3**

1. Show these 5 nodes (x, tanh(x)) (5 pts)

1. Use these 5 nodes as given data to form the Van der Monde matrix (10 pts.) and find a polynomial to interpolate these 5 nodes (10 pts). The specific procedure of formulating the Van der Monde Matrix is required.
   1. 
   2. polynomials =
2. Write down the cardinal functions for these 5 nodes (20 pts), and use the Lagrange polynomials to interpolate these 5 nodes, show the polynomial (15 pts).
   1. 
   2. Polynomial =

1. Based on these 5 nodes, use linear spline function to approximate f(x) = tanh(x), x ∈ [−2,2] (25 pts). The specific liner splines for each sub- interval are required.
   1. 
2. Based on these 5 nodes, use cubic spline function to approximate f(x) = tanh(x), x ∈ [−2,2] (25 pts). The specific cubic splines for each sub- interval are required.

