Numerical Analysis

Math 370 — MWF 2:30-3:25
Spring 1997 — 127 Fowler

(03.12.97) Review for Exam 2

The first exercise we will do is known as **focused listing**. In groups of two (pairs) I want you to take 3 MINUTES and write down all the important concepts and phrases/words which we have learned in this latest Unit on Interpolation and Curve Fitting.

1.

2.

3.

4.

5.

After you have completed your list share it with your partner and try and generate a combined list which is larger than either of your separate lists.

Then as a class we will generate as large a list as we can.

Review Questions

1. Given the data $(0,0),(1,2),(2,9)$ compute the Lagrange interpolating polynomial
2. Given the same data as above compute the Newton interpolating polynomial
3. Given the unknown function is $f(x) = x^3 + x$ find a bound on the error between the Lagrange interpolating polynomial of degrees 2 and $f(x)$
4. Explain when you would use interpolation and when you would use curve fitting when given a set of data points (x_k, y_k) where k goes from 0 to m
5. Using the same given the data set compute the line of best fit through the points.
6. What is the relationship between a natural cubic spline given 2 data points and the Lagrange interpolating polynomial of degree 2 (or the Newton interpolating polynomial of degree 2)? How is the clamped cubic spline related to these interpolants?
7. Write down the set of equations (how many?) for the clamped cubic spline on 2 nodes.
8. What if instead of assuming that we are using the line $y = ax + b$ as the best fit curve we use the exponential curve $y = ae^{bx}$ Use the given data above to find the best exponential curve which fits the data.

NOTE: Exam 2 Will Be Held In Fowler 201 on Fri Mar 14