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Math-5630/6630
Introduction to Numerical Analysis I
Summer 2007

Homework 5

Problems

1. Do problem 3 on p. 376 of your textbook.

2. Write the polynomial of order 3 that agrees with $f(0) = 0$, $f'(0) = 2$, $f''(0) = 0$, $f'''(0) = 18$. Evaluate this polynomial at $x = 1$.

3. Write the Lagrange interpolating polynomial of order 3 that agrees with $f(-4) = 56$, $f(-2) = -12$, $f(0) = 0$, and $f(2) = 44$. Evaluate this polynomial at $x = 1$.

4. The data for problems 2 and 3 was generated using $f(x) = x^4 + 3x^3 + 2x$, compute $f(1)$ and the errors in the above two approximations.

*5. Derive error bounds for the approximations you derived in problems 2 and 3. Is your answer to problem 4 consistent with these bounds?

Extra Credit:

Do problem 5 on p. 283 of your textbook.

* Math 6630.