

## Math 444/544

## Guide for Test 1

Here are some sample questions from Chapter 1. I attempted to outline my test and give you an outline, but there is no warranty.

1. For the function  $f(x) = **$  construct the Taylor approximation  $P_2(x)$  around  $x_0 = ***$  and the error term  $R_2(x)$ . If we use  $P_2(** **)$  to approximate  $f(** **)$  what bound do we have on the error?
2. What is condition number? Illustrate with an example.
3. What is loss of significance? Illustrate with an example.
4. What is instability? Illustrate with an example.
5. Let  $a = **$ ,  $b = * **$ , and  $c = * * **$ . Using 3-digit rounding arithmetic, compute  $a(b + c)$  and  $ab + ac$ . Which way of computing is better?
6. Find the order of convergence of
  - (a)  $**$  as  $h \rightarrow 0$ .
  - (b)  $***$  as  $n \rightarrow \infty$ .
7. **Math 444 students:** Make sure you wrote your name on the test.  
**Math 544 students:** Something harder.